

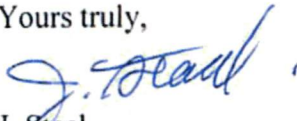
....2/

Please consider this to be a formal application for an FAA STC amendment under the provisions of the Canada/U.S. Bilateral Airworthiness Agreement.

In support of this application documentation per the enclosed Aero Design Ltd letter of 30 December 2014 is attached. Soft copies of the documents are included on the enclosed three CDs . A reference copy of FAA STC SR03317NY Issued September 24, 2013 is also enclosed.

Please contact the undersigned if needed.

Yours truly,



J. Staal
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Engineering, Edmonton
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Enclosure(s)

cc: Aero Design Ltd., Powell River, B.C.



Transport
Canada

Transports
Canada

1100 9700 Jasper Avenue NW
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Canada

Your file Votre référence
SR03317NY

Our file Notre référence
C-15-0024
SH12-58 Iss. 3

17 February 2015

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office ANE-170
1600 Stewart Avenue, Suite 410
Westbury, NY, 11590
USA

Attention: Mr Gaetano Sciortino

Subject: STC SH12-58 Issue 3, Bell Helicopter 429, Installation of Quick Release Cargo Basket.

We have received an application from a Canadian resident, Aero Design Ltd., for the reissue of a Canadian Supplemental Type Certificate and amendment of the FAA STC SR03317NY to cover the amendments to the Quick Release Cargo Basket installation on the Bell 429 helicopters.

This revision is primarily to update the address for Aero Design Ltd. as well as addressing the installation on later serial number Bell 429 helicopters which have different attachment provisions.

We have reviewed the applicant's submission and certify that the design change complies with the basis of certification specified in Canadian Type Certificate H-107. We have issued STC SH12-58 Iss 3 dated December 3, 2014. We also confirm that compliance is demonstrated with FAA Type Certificate R00003RD Revision 2, unless additional technical conditions are applied by the FAA.

"In accordance with the FAA Memorandum on Deviation Request to FAA Order 8110.4C, 8110.115, and 8110.54A dated October 9, 2012, TCCA confirms that ICAs related to this STC application meet the content and format of MSI 53 (determined to be equivalent to FAA Order 8110.54, 14 CFR 23.1529, 25.1529, 27.1529, 29.1529, 25.1729, 31.82, 33.4 Part 26 as appropriate) and, that TCCA will take appropriate corrective actions for any ICA issues related to this STC which may arise during post-certification sampling to be conducted by the FAA."

Canada 

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 959.91

BELL 429

QUICK RELEASE CARGO BASKET

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket installed in accordance with the following AERO Design Ltd. Document Control Lists:

- DCL959-1, Revision 0 (Cargo Basket Installation)
- DCL959-2, Revision 0 (Mounting Provisions Installation)

or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 28 September, 2012

AERO Design Ltd.
Engineering Consultants

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RECORD OF REVISIONS

| Revision Number | Issue Date | Date Inserted | By |
|-----------------|--------------|---------------|----------------|
| 0 | 28 Sept 2012 | | Original Issue |
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LIST OF EFFECTIVE PAGES

List of Revisions Revision 0 (Original Issue) 28 September 2012

List of Effective Pages

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| 04-00-00 | 6 | 0 |
| 05-00-00 | 7-10 | 0 |
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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of Canadian Aviation Regulations (CAR) 527.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

This installation is not compatible with float installations.

0-5 GENERAL DESCRIPTION

The cargo basket is installed in accordance with drawing 95901. The basket is 97" long, 25.5" wide, and 18.25" high (2464 mm, 648 mm, 464 mm respectively), and is made of a steel welded tubing structure, lined with expanded steel mesh. The basket has a hinged lid with a locking handle and secondary automatic safety catch.

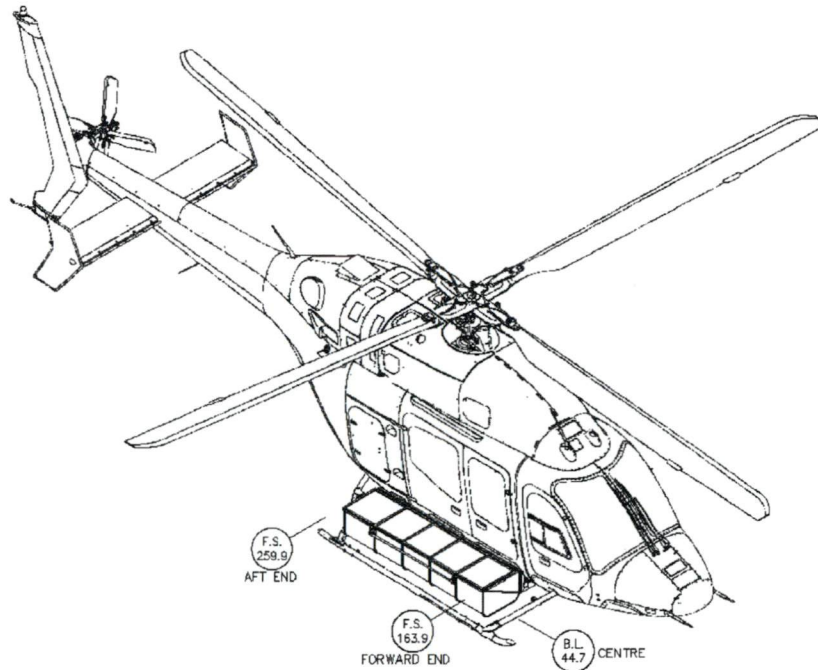


Figure 0.1 – Cargo Basket Installation

0-6 STRUCTURAL PROVISIONS

The Attachment Provisions are installed on the helicopter in accordance with drawing 95902. The attachment provisions consist of four fittings that are installed on the helicopter mounting points for the cabin step, which is removed from both sides.

The beams are steel tubing which attach to the fittings on the fuselage and stick out from the side of the helicopter. The quick release mechanism is built into the beams. It allows for the installation and removal of the basket quickly without tools, leaving the mounting beams in place.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket

- a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain basket, replace spring, refer to section 25-10.
- b) Inspect latching of the lid for correct operation. Replace handle brackets on basket if handle is not retained in latched position, refer to section 25-8. Replace handle springs if handle is not held in towards brackets, refer to section 25-9.

200 Hour or Annual Inspection

1. Inspection Area: Basket

- a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
- b) Visually inspect basket mesh for damage.

2. Inspection Area: Beams

- a) Visually inspect beams attaching basket to the helicopter for cracks, corrosion or other damage.
- b) Visually inspect lugs attaching the basket to the beams for security and damage.
- c) Visually inspect plates attaching beams to attachment provisions for cracks, corrosion or other damage.
- d) Visually inspect bolts attaching beams to external attachment provisions for security and damage.

3. Inspection Area: Attachment Provisions

- a) Visually inspect each fitting for cracks, corrosion or other damage.
- b) Visually inspect bolts attaching fittings to fuselage for condition and security.

4. Inspection Area: Forward Cross Tube

- a) Visually inspect condition of erosion tape on forward cross tube, directly forward of cargo basket.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 200 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket and Lid Tubing*Damage Limits:*

- a) Deformation of any tubing between welded joints not exceeding 0.25 inches in any direction must be repaired in accordance with the instructions below.
- b) Corrosion not exceeding 0.015 inches deep to be dressed out to a smooth contour.
- c) Corrosion exceeding 0.015 inches deep to be repaired in accordance with the instructions below.

Repair Instructions:

- a) Repair Basket and Lid tubing in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, paragraphs 4-80, 4-81 and 4-83 as required.

Basket and Lid are fabricated from the following materials:

Basket Hoops, Spine: 1/2" square steel tube
Lid, Basket Rim: 3/4" square steel tube

- b) Touch up with polyurethane paint as required following repairs.

2. Basket and Lid Mesh*Damage Limits:*

- a) The basket mesh may be deformed or stretched without limit, so long as the welds attaching the mesh to the basket or lid are not compromised. If welds are compromised, repair in accordance with instructions below.
- b) Tears in the mesh not exceeding 4 cells in any direction may be repaired by patching. Maximum one repair patch per bay. See instructions below.

Repair Instructions:

- a) Repair mesh to tube welds in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.

Mesh: 3/4" 16 ga. (0.040") expanded steel mesh

- b) Patch repair:

- a. Cut two aluminum sheets, minimum 0.040 inches thick, extending to at least 1 complete cell outside of torn area. Drill #9 holes in the corners of the sheet, located to clear the mesh when installed.
- b. Attach patches, one inside and one outside, to the mesh with AN3 Bolts, AN970-3 Washers, and MS21044N3 Nuts.

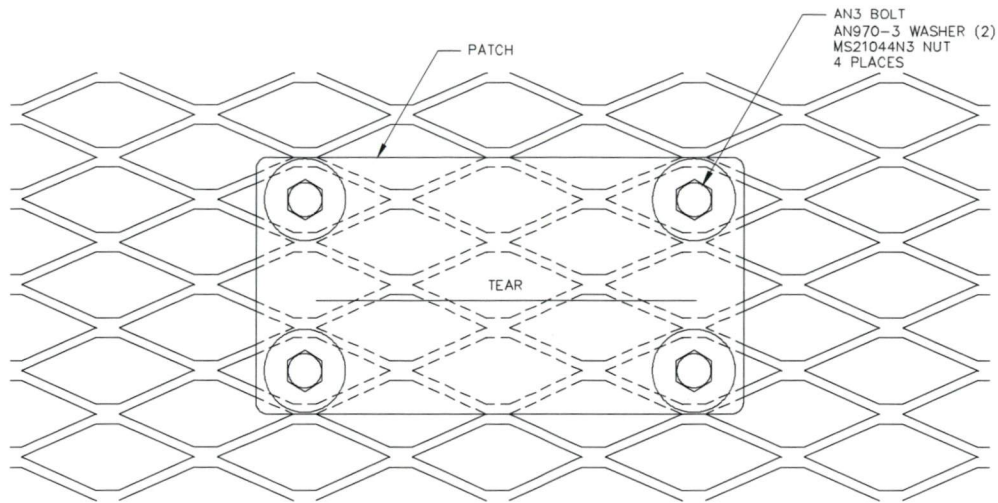


Figure 5.1 – Patch Repair

- c) Touch up with polyurethane paint as required following repairs.

3. Beams

Damage Limits:

- a) Critical slot dimensions are shown in Figure 5.2.

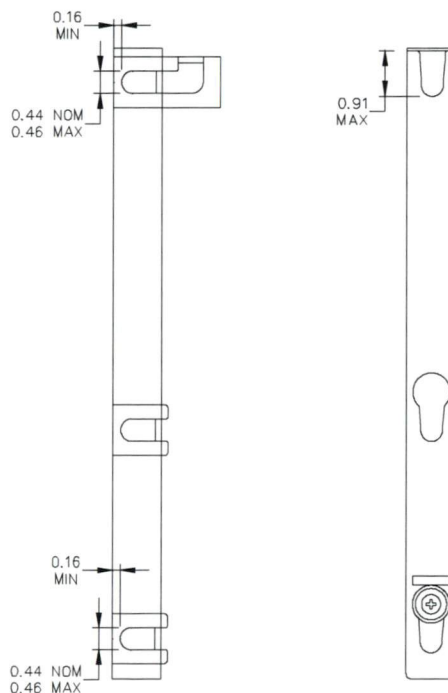


Figure 5.2 – Critical Beam Slot Dimensions

- b) Attempt to insert 15/32 drill shank into bottom end of vertical slot in aft beam. If drill can be inserted, slot is worn beyond limit.
- c) Nicks and/or gouges on the top or bottom faces up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.

- d) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- e) Cracks at any location on the beam are not acceptable.
- f) Touch up with polyurethane paint as required following repairs.

Repair Instructions:

Do not repair damage to beams if beyond limits specified. Replace beams in accordance with section 25-7.

4. Plates

Damage Limits

- a) Nicks and/or gouges on any surface up to 0.015" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Cracks on any surface are not acceptable.
- c) Corrosion on any surface up to 0.015 deep, not exceeding 1 square inch may be dressed out to a smooth contour.

Repair Instructions

Replace plates if damage exceeds limits above. See section 25-7.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The beams are supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

2. Cargo Basket

The cargo basket is supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

3. Attachment Fittings and Plates

The attachment fittings and plates are supplied anodized. If the anodizing is damaged, parts are to be cleaned, primed and painted in accordance with Bell Standard Procedures Manual, BHT-SPM-ALL, Chapter 4 and Chapter 5.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation in the locations noted:

- a) Located on basket lid:



CHAPTER 25 – EQUIPMENT AND FURNISHINGS**SECTION 50 – CARGO COMPARTMENTS****25-1 CARGO BASKET REMOVAL**

Refer to Figure 25.1 and 25.2.

1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
2. Lift basket until upper attachment is out of keyway on aft beam.
3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
4. Lower aft end of basket to the ground.
5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.

25-2 CARGO BASKET INSTALLATION

Refer to Figure 25.1 and 25.2.

1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.

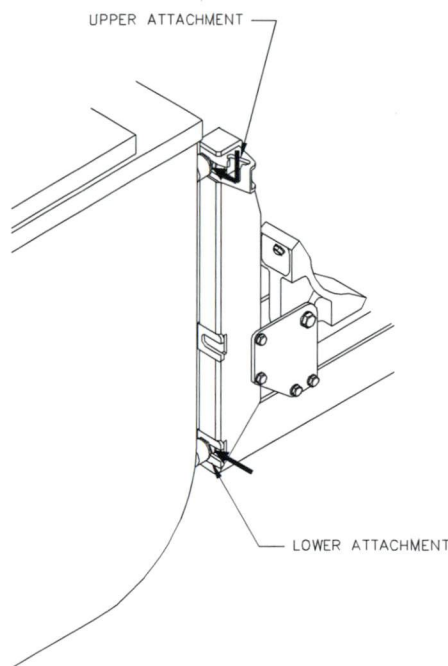


Figure 25.1 – Basket Forward Attachment

3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.

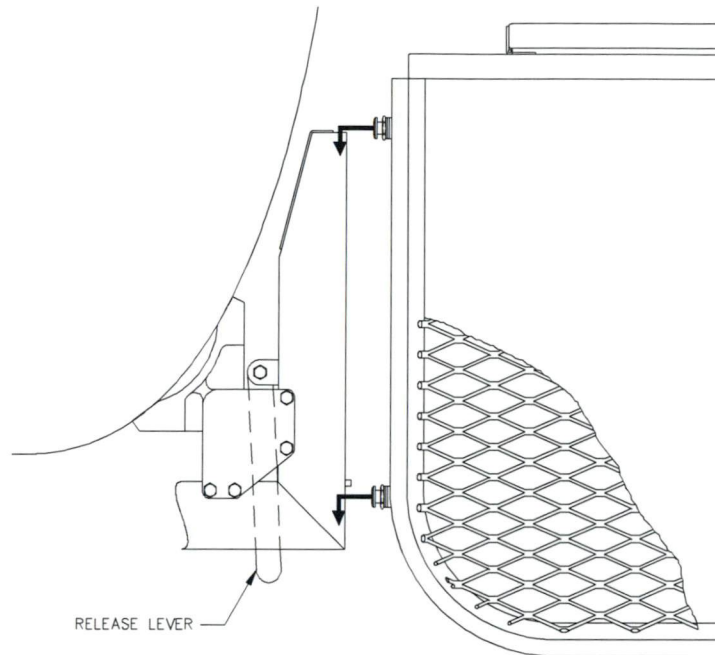


Figure 25.2 – Basket Aft Attachment

4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.
5. Check that basket is locked in place by attempting to lift aft end of basket.
6. If required, install abrasion strip on forward cross tube. See section 25-7.

25-3 MOUNTING BEAMS REMOVAL

Refer to Figure 25.3 and 25.4.

1. Remove Cargo Basket. Refer to section 25-1.
2. At aft mounting beam, remove AN4-16A Bolt, NAS1149F0463P Washer (2) and MS21044N4 Nut that attach 95922-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95922-02 Plates to attachment fitting on opposite side. Remove 95931-01-00 Aft Beam from helicopter.
3. At forward mounting beam, remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach 95922-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95922-02 plates to attachment fitting on opposite side. Remove 95930-01-01/-02 Forward Beam from helicopter.
4. Remove four 95923-01 Bushings from attachment fittings.

5. If required, remove hardware, bushings, and plates from beams prior to storage.

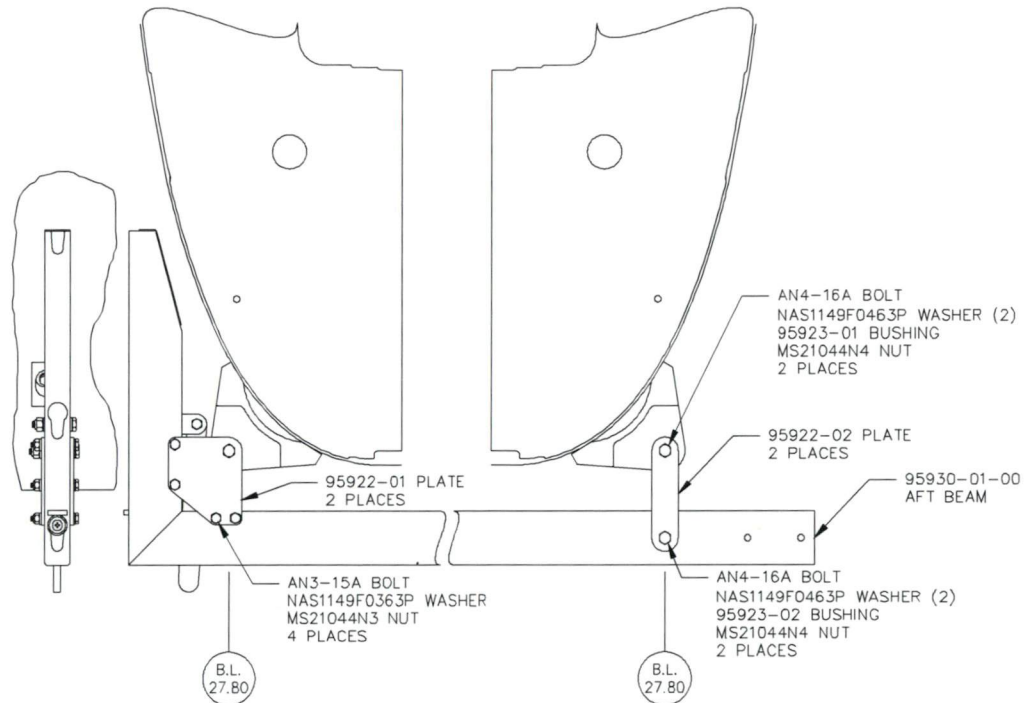


Figure 25.3 – Aft Beam Removal / Installation

Looking Aft, Right Hand Installation Shown

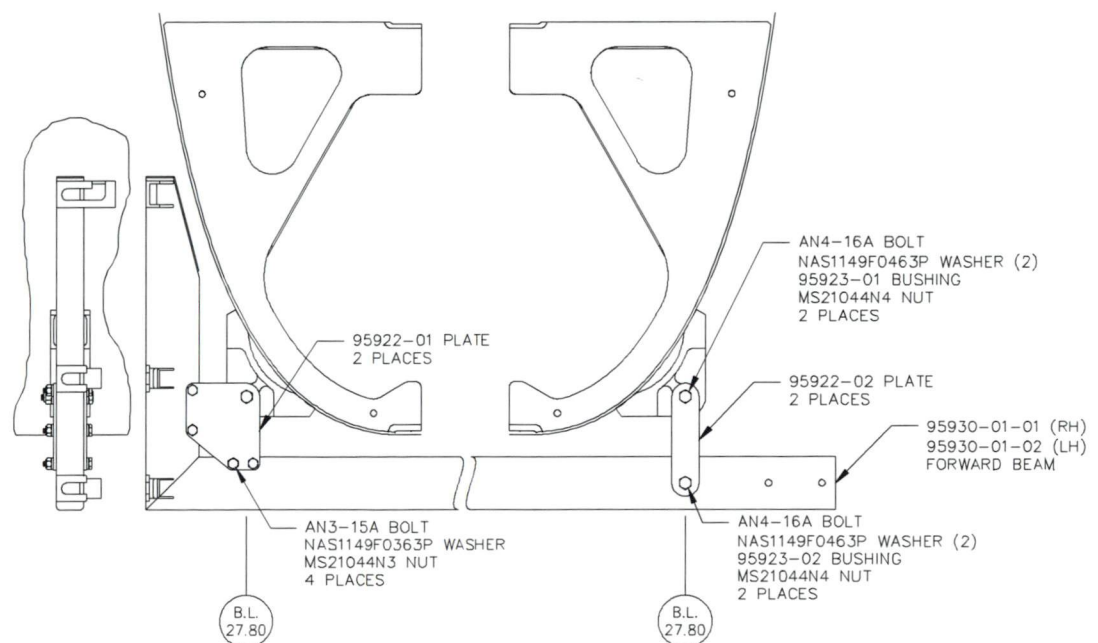


Figure 25.4 – Forward Beam Removal / Installation

Looking Aft, Right Hand Installation Shown

25-4 MOUNTING BEAMS INSTALLATION

Refer to Figure 25.3 and 25.4.

1. Attachment Provisions installed in accordance with section 25-6 are required prior to installing the Mounting Beams.
2. If required, install two 95922-01 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using four AN3-15A Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut. Torque nuts to 20-25 inch-lbs (2-3 N-m).
3. If required, install two 95922-02 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using one AN4-16A Bolt, NAS1149F0463P Washer (2), 95923-02 Bushing and MS21044N4 Nut. Do not tighten nuts, plates must be free to move.
4. Insert four 95923-01 Bushing in each attachment fitting on fuselage.
5. Raise horizontal section of forward beam up to forward attachment fitting on helicopter. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
6. Raise forward beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
7. Raise horizontal section of aft beam up to forward attachment fitting on helicopter. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
8. Raise aft beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
9. Torque MS21044N4 nuts to 50-70 inch-lbs (6-8 N-m).

25-5 ATTACHMENT FITTINGS REMOVAL

Refer to Figure 25.5.

1. Mounting Beams must be removed prior to removal of the Attachment Fittings. See section 25-3
2. Remove the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:
 - a. Access Cover, station 184.0 (300AL and 300AR)
 - b. Access Cover, station 224.0 (300BL and 300BR)
3. Remove two NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut from each attachment fitting.
4. Remove two 95920-01 Forward Fitting, 95921-01 Aft Right Fitting, and 95921-02 Aft Left Fitting from helicopter.

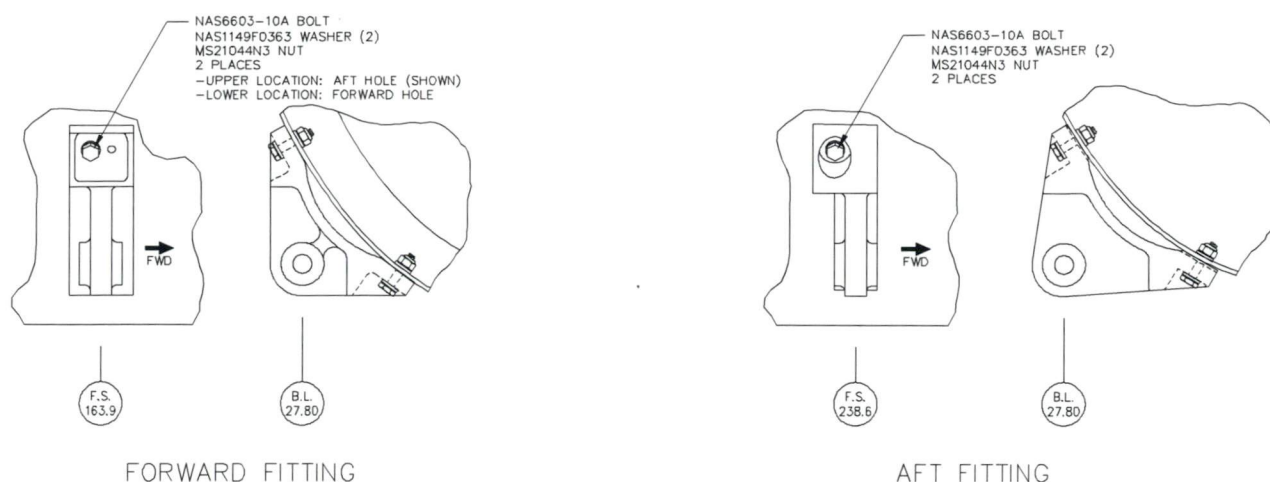


Figure 25.5 – Attachment Fittings Removal / Installation
(Right side shown, left side opposite)

25-6 ATTACHMENT FITTINGS INSTALLATION

Refer to Figure 25.5.

Materials Required: C-251 Sealant (ref: BHT-ALL-SPM)

1. Passenger Step Assembly must be removed prior to installation of the Attachment Fittings. Refer to Bell 429 Maintenance Manual, BHT-429-MM-1, section 32-57.
2. At the location of the forward and aft fittings, make sure the faying surfaces of the fitting assembly and fuselage skin are clean and prepared for bonding. Otherwise, refer to the BHT-ELEC-SPM, Chapter 8
3. At four locations, apply sealant (C-251) to the faying surfaces of the fitting assembly and the fuselage skin.
4. Apply sealant (C-251) to the shanks of the bolts. Do not apply sealant to the bolt threads. Install while sealant is wet.
5. Install 95920-01 Forward Fitting on right hand forward step location on fuselage using NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut. Repeat for left side.
6. Install 95921-01 Aft Right Fitting on right hand aft step location on fuselage using NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut.
7. Install 95921-02 Aft Left Fitting on right hand aft step location on fuselage using NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut.
8. Torque nuts (8) to 20-25 inch-lbs (2-3 N-m).
9. At centre step support locations on fuselage, install two AN3-4A Bolt, NAS1149F0363 (2) Washer, and MS21044N3 Nut. Torque nuts to 12-15 inch-lbs (1.5-2 N-m).
10. Overcoat the fasteners with sealant (C-251).

11. Install the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:

- a. Access Cover, station 184.0 (300AL and 300AR)
- b. Access Cover, station 224.0 (300BL and 300BR)

25-7 ABRASION STRIP INSTALLATION

Abrasion strip is to be installed to protect forward cross tube from damage during installation and removal of the cargo basket.

1. Brush apply a thin coat of 3M-86A adhesion promoter on cross tube area to receive abrasion strip and allow to dry for 10 minutes.
2. Apply abrasion strip 427-015-001-131, or equivalent polyurethane protective strip (3M 8663) as applicable.

25-8 HANDLE BRACKET REPLACEMENT

Refer to Figure 25.6

1. Remove two (2) AN3-11A Bolts, AN960-10 Washers and MS21044N3 Nuts from each Handle Bracket (84267-01). Remove handle brackets from basket hoops.

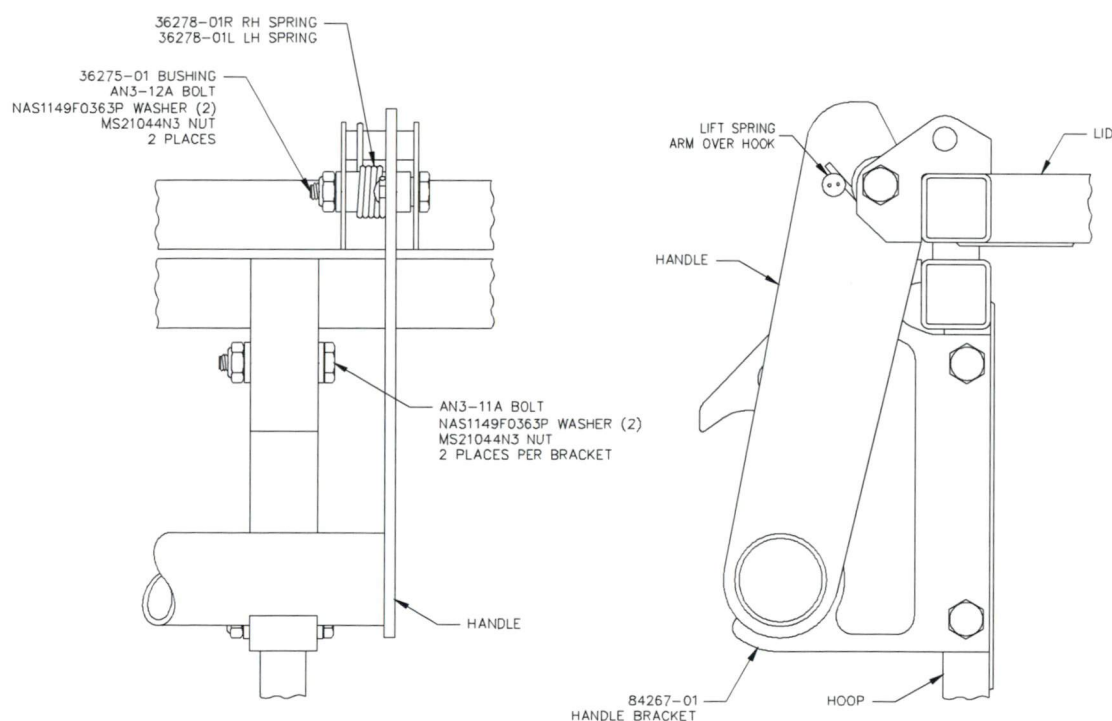


Figure 25.6 – Handle Bracket Parts

2. Slide two (2) replacement Handle Brackets (84267-01) onto basket hoops. Align Handle Bracket to bushings in hoop. Insert two (2) AN3-11A Bolts with AN960-10 Washers through Handle Bracket and bushing. Install AN960-10 Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2-3 N-m).

25-9 HANDLE SPRING REPLACEMENT

Refer to Figure 25.6.

1. Remove two (2) AN3-12A Bolts, NAS1149F0363P Washers (2) and MS21044N3 Nuts attaching handle to lid. Remove handle from basket. Remove springs from handle.
2. Slide replacement 36278-01R and 36278-01L Springs onto handle. Spring arm will catch on hook when on the correct side. Insert two 36275-01 bushings into handle attachments. Locate handle on basket, and insert two (2) AN3-12A Bolts with NAS1149F0363P Washers through bracket on lid and bushing in handle. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2-3 N-m). Lift spring arm over catch on handle and bar on lid bracket.

25-10 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove basket from mounting beams, refer to section 25-1.
2. At lower attachment keyway on aft beam, remove #10-32 stainless steel countersunk screw, 95931-10 Stop, and 69830-23 Spring. Discard defective spring.
3. Place 95931-10 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of aft beam. Thread screw into barrel nut inside lever arm. Torque screw to 20-25 in-lbs (2-3 N-m).

25-11 WEIGHT AND BALANCE

Multiple weight and balance configurations are required as the basket may be installed or removed in the field. The first is the mounting provisions only. The second is the configuration with the basket installed.

1. 95902 Mounting Provisions

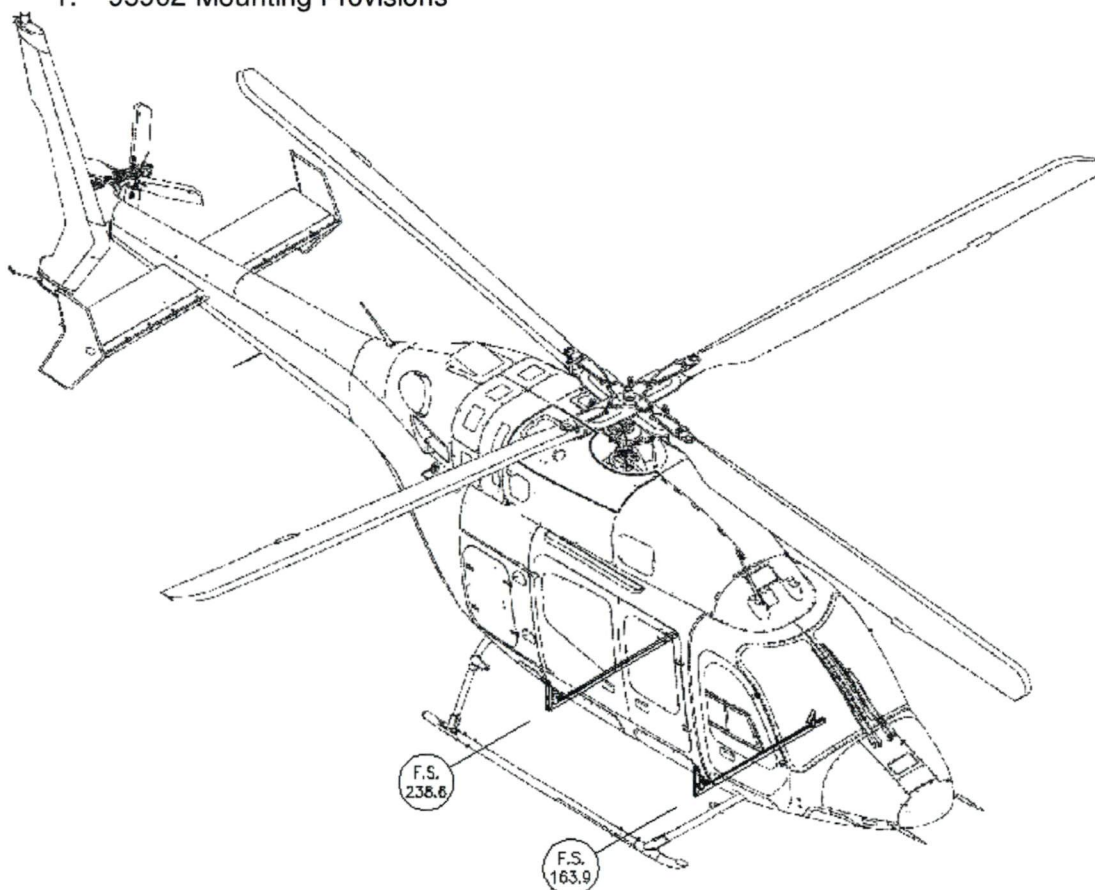


Figure 25.7 – Mounting Provisions Installation

| Part # | Standard Units Description | Weight (lbs) | Longitudinal | | Lateral | |
|-------------|--|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 95902-01-01 | RH Mounting Provisions Installation (Total) | 31.2 | 201.47 | 6286.01 | 2.91 | 90.85 |
| 95902-01-02 | LH Mounting Provisions Installation (Total) | 31.2 | 201.47 | 6286.01 | -2.91 | -90.85 |
| | | | | | | |
| | Metric Units | (kg) | (mm) | (mm-kg) | (mm) | (mm-kg) |
| 95902-01-01 | RH Mounting Provisions Installation (Total) | 14.15 | 5117.46 | 72422.75 | 73.96 | 1046.73 |
| 95902-01-02 | LH Mounting Provisions Installation (Total) | 14.15 | 5117.46 | 72422.75 | -73.96 | 1046.73 |

2. 95901 Quick Release Cargo Basket Installation

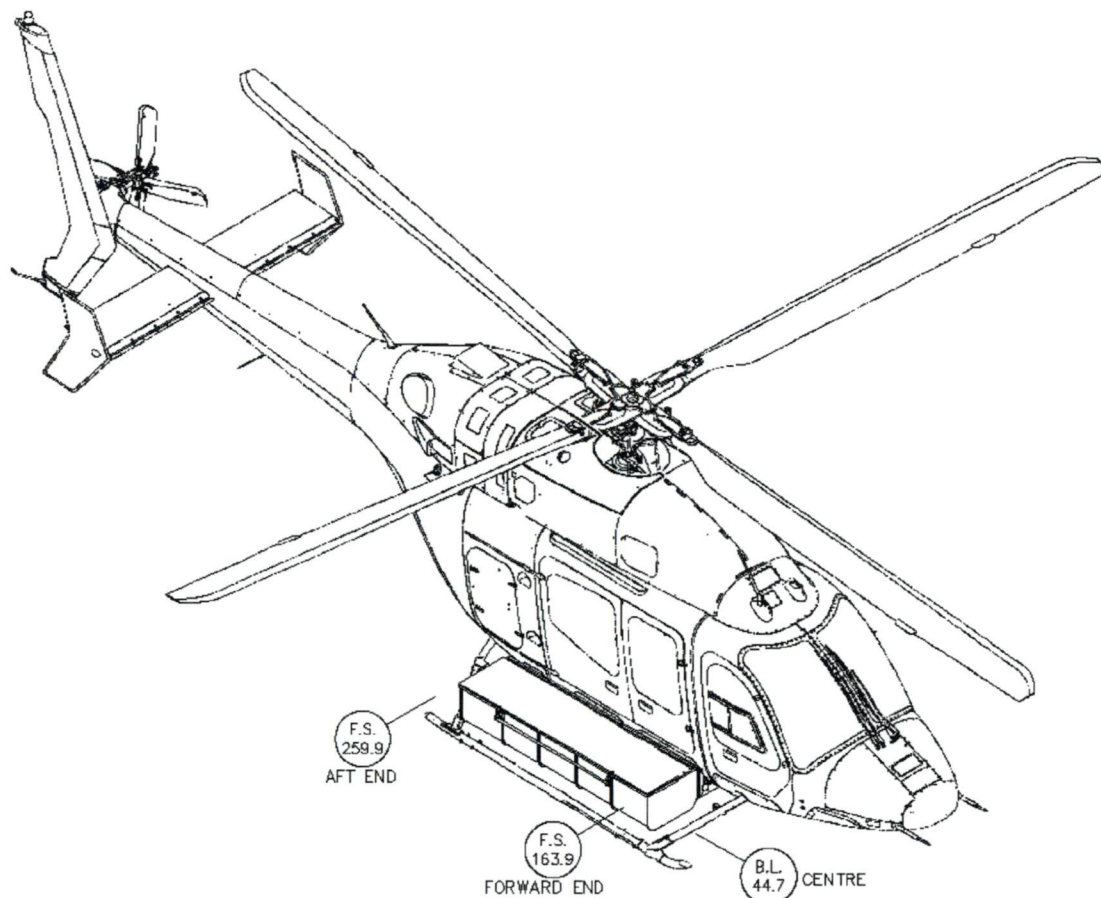


Figure 25.8 – Cargo Basket Installation

| Part # | Standard Units Description | Weight (lbs) | Longitudinal | | Lateral | |
|-------------|---|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 95910-01-01 | RH Cargo Basket | 71.2 | 211.86 | 15084.43 | 44.70 | 3182.64 |
| 95901-01-01 | RH Quick Release Cargo Basket Installation (Total) | 102.4 | 208.70 | 21370.44 | 31.97 | 3273.49 |
| 95910-01-02 | LH Cargo Basket | 71.2 | 211.86 | 15084.43 | -44.70 | -3182.64 |
| 95901-01-02 | LH Quick Release Cargo Basket Installation (Total) | 102.4 | 208.70 | 21370.44 | -31.97 | -3273.49 |
| | Metric Units | (kg) | (mm) | (mm-kg) | (mm) | (mm-kg) |
| 95910-01-01 | RH Cargo Basket | 32.30 | 5381.24 | 173791.66 | 1135.38 | 36668.02 |
| 95901-01-01 | RH Quick Release Cargo Basket Installation (Total) | 46.45 | 5300.87 | 246214.42 | 811.98 | 37714.75 |
| 95910-01-02 | LH Cargo Basket | 32.30 | 5381.24 | 173791.66 | -1135.38 | -36668.02 |
| 95901-01-02 | LH Quick Release Cargo Basket Installation (Total) | 46.45 | 5300.87 | 246214.42 | -811.98 | -37714.75 |

Cargo Basket Options – Standard Units

| Part # | Description | Weight (lbs) | Longitudinal | | Lateral | |
|----------|------------------------|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 70408-01 | Hangar Wheel (Aft End) | 0.8 | 257.50 | 206.00 | 44.70 | 35.76 |

Cargo Basket Options – Metric Units

| Part # | Description | Weight (lbs) | Longitudinal | | Lateral | |
|----------|------------------------|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 70408-01 | Hangar Wheel (Aft End) | 0.36 | 6540.50 | 2354.58 | 1135.38 | 412.00 |

25-12 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

c-13-0747

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD959, Rev. 0

| | |
|--|--|
| 1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 9888A Malaspina Road Powell River, BC V8A 0G3 | 2. ALL CORRESPONDANCE TO: AERO Design Ltd. 9888A Malaspina Road Powell River, BC V8A 0G3 |
|--|--|

| | | |
|---|------------------------------------|--------------------------------------|
| 3. IDENTIFICATION OF PRODUCT: MAKE: Bell MODEL: 429 | SERIAL No.: All Eligible | REGISTRATION: All Eligible |
|---|------------------------------------|--------------------------------------|

4. REQUEST FOR:

| | | | |
|---|---|----------------------------|---------|
| A. <input type="checkbox"/> SUPPLEMENTAL TYPE CERTIFICATE (STC) | B. <input checked="" type="checkbox"/> STC REVISION | STC No. SH12-58 | Issue 2 |
| C. <input type="checkbox"/> LIMITED STC (LSTC) | D. <input type="checkbox"/> LSTC REVISION | LSTC No. <i>See remark</i> | Issue |
| E. <input type="checkbox"/> REPAIR DESIGN CERTIFICATE (RDC) | F. <input type="checkbox"/> RDC REVISION | RDC No. | Issue |
| G. <input type="checkbox"/> F.A.A. SUPPLEMENTAL TYPE CERTIFICATE | H. <input type="checkbox"/> FAA STC REVISION | STC No. | Issue |
| I. <input type="checkbox"/> FAMILIARIZATION OF A FOREIGN TYPE DESIGN CHANGE | | | |

FAA STC # _____ EASA STC # _____ OTHER STC # _____

5. TITLE OF MODIFICATION OR REPAIR:
External Cargo Basket and Cabin Steps Installation

6. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:
Installation of quick release cargo basket, fixed cabin step, and optional quick release cabin step.

7. APPLICABLE TYPE CERTIFICATE (TC) DOCUMENTS:
A. Cdn. TC NO. H-107 B. Foreign TC No. C. OTHER (Please specify)

8. PROPOSED BASIS OF APPROVAL:
A. SAME AS Cdn. TC ☒ B. SAME AS Foreign TC ☐ C. OTHER ☐ (Please specify)

| 9. DOCUMENTATION CHECKLIST | REQUIRED | | (FOR DOT USE ONLY) | | |
|--|------------|----|--------------------|----|------|
| | YES | NO | YES | NO | DATE |
| COMPLIANCE PROGRAM | | X | | | |
| MASTER DRAWING LIST | X | | | | |
| ENGINEERING REPORTS | | X | | | |
| MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS | <i>1/1</i> | X | | | |
| WEIGHT AND MOMENT CHANGE | | X | | | |
| FLIGHT MANUAL SUPPLEMENT | | X | | | |
| INSTRUCTIONS FOR CONTINUING AIRWORTHINESS | | X | | | |
| AIRWORTHINESS LIMITATIONS | | X | | | |
| MAINTENANCE MANUAL SUPPLEMENT | | X | | | |
| ELECTRICAL LOAD ANALYSIS | | X | | | |
| FLIGHT TEST DATA | | X | | | |
| DESIGN DRAWINGS | | X | | | |
| DRAFT STC, LSTC OR RDA | | X | | | |
| OTHER (Specify): | | | | | |

10. APPLICANT'S REMARKS:
Application is for revision to technical documents without STC re-issue.

11. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

Aero Design Ltd.

PER: *[Signature]* Engineering Technologist 29 July 2013

SIGNATURE OF APPLICANT TITLE DATE

12. *[Signature]* *[Signature]* *30 July 2013*

SIGNATURE REGIONAL AIRWORTHINESS ENGINEER TITLE DATE

DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|--|------------------------------|---|
| INSTALLATION DOCUMENTS | | |
| 70403 | Auxiliary Latch Modification | 4 |
| 70408 | Installation, Hanger Wheel | 0 |
| FABRICATION DOCUMENTS | | |
| 70428 | Assembly, Hanger Wheel | 0 |
| 70438 | Parts, Hanger Wheel | 0 |
| <p>Note: This DCL is identical to DCL704, Rev. 7, but only includes configurations eligible on the Bell 429.</p> | | |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>APPROVAL:</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <div style="display: inline-block; text-align: center;"> <small>Transport Canada</small> </div> <div style="display: inline-block; text-align: center;"> <small>Transports Canada</small> </div> </div> <p style="text-align: center;">AIRCRAFT CERTIFICATION DIVISION</p> <p style="text-align: center; font-size: 1.2em;">APPROVED</p> <p>By <u><i>[Signature]</i></u></p> <p>Appr'l No. <u>5412-58</u></p> <p>Appr'l Date <u>12-11-16</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>12-11-16</u></p> <p style="text-align: center; font-size: 0.8em;">YY-MM-DD</p> <p>REVISED: 13-07-30</p> </div> <div style="width: 40%;"> <p>ORIGINAL DATE: 24 July 2013</p> <p>REVISION DATE:</p> </div> <div style="width: 30%;"> <p style="text-align: center; font-weight: bold; font-size: 1.1em;">AERO DESIGN LTD.</p> <p style="text-align: center; font-size: 0.9em;">2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333</p> </div> </div> | | |
| SHEET 1 OF 1 | | Cargo Basket Modifications |
| DCL704-429 | | <p>Rev.</p> <p style="font-size: 2em; font-weight: bold;">0</p> |

| | | | |
|---|--|---|--------------------------------|
| SENDER ACCOUNT NO. N° DE COMPTE DE L'EXPÉDITEUR 4367155 | | IMPORTANT - TÉLÉPHONE (403) 250 8027 | |
| SENDER (FROM) / EXPÉDITEUR (DE) AERO DESIGN | | MO DY/JR YR/AN 02/13/13 | |
| STREET ADDRESS / ADRESSE (N° ET RUE) 2013 39 AVE NE | | | |
| CITY / VILLE CALGARY | | PROV/STATE/ÉTAT AB | POSTAL / ZIP T2E 6R7 |
| RECEIVER (TO) / DESTINATAIRE (À) TRANSPORT CANADA AIRCRAFT CERT. | | | |
| STREET ADDRESS / ADRESSE (N° ET RUE) 11th Floor, 9700 JASPER AVE | | | |
| CITY / VILLE EDMONTON | | PROV/STATE/ÉTAT AB | POSTAL / ZIP T5J 4E6 |
| ATTN: (NAME / DEPT.) / À L'ATTENTION DE (NOM / SERVICE) JACK STAAL | | IMPORTANT - TÉLÉPHONE (780) 495 5227 | |
| DESCRIPTION (INCLUDING DANGEROUS GOODS / INCLUANT MARCHANDISES DANGEREUSES) DOCUMENTS | | | |
| SENDER REFERENCE (IF ANY) / REF. DE L'EXPÉD. | | PICK UP / CUEILLETTE - N° DE CONF. 0002 | |

SENDER SIGNATURE / SIGNATURE DE L'EXPÉDITEUR

X *Chuk* X
SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO

1746040

| | | | |
|---|--|--|--|
| SHIP MODE / MODE DE TRANSPORT | | | |
| AIR AÉRIEN <input type="checkbox"/> | | GROUND ROUTIER <input checked="" type="checkbox"/> | |
| PKG / EMBAL. | | SERVICE | |
| 1 TYPE ONLY TYPE SEULEMENT CHOOSE CHOISIR | PURO- LETTER <input type="checkbox"/> | 9 AM 9 h <input type="checkbox"/> | |
| | PURO- PAK <input checked="" type="checkbox"/> | 10:30 AM 10 h 30 <input type="checkbox"/> | |
| | OTHER AUTRE <input type="checkbox"/> | SAT. SAM. <input type="checkbox"/> | |
| PAYMENT / PAIEMENT | | | |
| CASH COMPTANT <input type="checkbox"/> | | CREDIT CARD CARTE DE CRÉDIT <input type="checkbox"/> | |
| RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS | | | |
| RECEIVER DESTINATAIRE <input type="checkbox"/> | | 3RD PARTY TIERS <input type="checkbox"/> | |
| SHIPMENT / DÉTAILS / EXPÉDITION | | | |
| #/Nbre PCS (4 MAXIMUM) 1 | | WEIGHT / POIDS SUBJ. TO CORR. / SUJET À CORR. KG 2 LB | |
| DECLARED VALUE / VALEUR DÉCLARÉE (SURCHARGE APPLIES OVER \$100) (SUPPLÉMENT AU-DESSUS DE 100 \$) \$ NDV \$5,000 MAX. MAX 5 000 \$ SEE CONDITIONS OF CARRIAGE ON REVERSE / CONDITIONS DE TRANSPORT AU VERSO | | | |

BILL OF LADING NO.
-NOT NEGOTIABLE
N° DE CONNAISSANCE
-NON NEGOCIABLE

2972 480 3498


www.purolator.com 1 888 SHIP-123

| | | |
|---|---|-------------------------------|
| COURIER INITIALS INITIALES DU COURRIER <input type="checkbox"/> | COURIER ROUTE ITINÉRAIRE DU COURRIER 200 | MO DY/JR YR/AN 2 15 |
| NO./N° TYPE <input type="checkbox"/> VISA <input type="checkbox"/> MC <input type="checkbox"/> AMEX | | EXP. DATE D'EXP. |

| | |
|---|--|
| RECEIVER OR THIRD PARTY ACCOUNT NO. / N° DE COMPTE DU DESTINATAIRE OU TIERS | CHARGES FRAIS TOTAL AMOUNT / MONTANT TOTAL |
|---|--|

THIRD PARTY BILLING NAME & ADDRESS / FACTURATION À UN TIERS (NOM & ADRESSE)

LIMITATION OF LIABILITY - IMPORTANT - PLEASE READ
THE AMOUNT OF ANY LOSS OR DAMAGE FOR WHICH THE
CARRIER MAY BE LIABLE SHALL NOT EXCEED \$2.00 PER
POUND (OR \$4.41 PER KILOGRAM) COMPUTED ON THE
TOTAL WEIGHT OF THE SHIPMENT UNLESS A HIGHER
VALUE IS DECLARED ON THE FACE OF THE BILL OF LADING
BY THE CONSIGNOR (SENDER). MAXIMUM DECLARED
VALUE SHALL NOT EXCEED \$5,000. N.B. NOTE CAREFULLY
CONDITIONS ON BACK HEREOF INCLUDING LIMITATIONS
AND EXCLUSIONS OF CARRIER'S LIABILITY, WHICH ARE
HEREBY ACCEPTED.LIMITATION DE RESPONSABILITÉ - IMPORTANT - LISEZ S.V.P.
LE MONTANT DE TOUTE Perte OU DOMMAGE DONT LE
TRANSPORTEUR POURRAIT ÊTRE RESPONSABLE NE DOIT PAS
EXCÉDER 2.00 \$ LA LIVRE (OU 4.41 \$ LE KILOGRAMME), CALCULÉ
SUR LE POIDS TOTAL DE L'EXPÉDITION, À MOINS QU'UNE VALEUR
SUPÉRIEURE N'AIT ÉTÉ DÉCLARÉE SUR LE RECTO DU
CONNAISSANCE PAR L'EXPÉDITEUR. LA VALEUR DÉCLARÉE
MAXIMALE NE DÉPASSERA PAS 5 000 \$. N.B. VEUILLEZ PRENDRE
CONNAISSANCE DES CONDITIONS AU VERSO, Y COMPRIS LES
LIMITATIONS ET EXCLUSIONS DE RESPONSABILITÉ DU
TRANSPORTEUR, QUI SONT ACCEPTÉES PAR LES PRÉSENTES.PLEASE REFER TO BILL OF LADING NUMBER FOR SHIPMENT STATUS / INQUIRIES.
POUR TOUT RENSEIGNEMENT, VEUILLEZ NOUS COMMUNIQUER LE NUMÉRO DE
CONNAISSANCE.

PUROLATOR COURIER LTD. - CONDITIONS OF CARRIAGE

CONDITION 1 RECEIPT & FREIGHT

Received at the point of origin on the date specified, from the sender mentioned herein, the property herein described; in apparent good order, except as noted (contents and conditions of contents of package unknown), marked, consigned and destined as indicated herein, which the carrier agrees to carry and to deliver to the consignee at the said destination, if on its own authorized route, or otherwise to cause to be carried by another carrier on the route to said destination, subject to the rates and classification in effect on the date of shipment.

It is mutually agreed, as to each carrier of all or any of the goods over all or any portion of the route to destination, and as to each party at any time interested in all or any of the goods, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, including conditions on back hereof, which are hereby agreed by the sender and accepted for himself and his assigns.

CONDITION 2 LIMITATION OF LIABILITY

No carrier is liable for loss, damage or delay to any goods carried under this Bill of Lading, unless notice thereof setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the originating carrier or the delivering carrier within sixty (60) days after the delivery of the goods, or, in case of failure to make delivery, within nine (9) months from the date of shipment.

The final statement of the claim must be filed within nine (9) months from the date of shipment together with a copy of the paid freight bill.

CONDITION 3 APPLICABLE LAW

The contract for the carriage of goods contained in this Bill of Lading shall be deemed to include and be subject to the terms and conditions prescribed by law of the jurisdiction where the goods originate which are if Newfoundland and Saskatchewan, the Motor Carrier Act of each such province; Nova Scotia, British Columbia and New Brunswick, the Motor Vehicle Act of each such province; Prince Edward Island, the Highway Traffic Act; Quebec, the Transport Act; Ontario, the Truck Transportation Act; Manitoba, The Highway Traffic Act; Alberta and the Yukon, the Motor Transport Act for such province and Territory; Nunavut and the Northwest Territories, the Motor Vehicles Act for each such Territory; and any regulations to each of the above mentioned Acts. The Convention for the Unification of Certain Rules relating to International Carriage by Air signed at Warsaw, Poland, October 12, 1929 or that Convention as amended by the Hague Protocol 1955, the Montreal Protocol No. 4, and/or the Convention supplementary to the Warsaw Convention for the Unification of Certain Rules relating to International Carriage by Air Performed by a Person Other than the Contracting Carrier, which may apply to the carriage of international shipments and, in most cases will limit the liability of Purolator in respect of loss or damage to, or delay in the carriage of, such shipments, may apply to the carriage of international shipments.

CONDITION 4 SPECIAL AGREEMENT

The parties agree that notwithstanding any disclosure of nature or value of the goods, the amount of any loss or damage, if any, including consequential, incidental or indirect damages, loss of earnings or profits, resulting from the loss of or damage to the goods and/or misdelivery, failure to deliver or delay in delivery of the goods, shall not exceed the maximum liability of the carrier aforesaid. Notwithstanding any other condition contained herein, the carrier is not financially responsible for the consequences of a delay in delivering a shipment by any particular time or from misdelivery or a failure to deliver.

CONDITION 5 PAYMENT GUARANTEE

The sender agrees to pay the carrier all shipping charges in the event the receiver, on a collect shipment or the third party on a third party billing shipment, refuses to pay the carrier.

CONDITION 6 RESERVATION OF RIGHT AND MODIFICATION OF CONTRACT

The carrier reserves the right to substitute alternate modes of transportation for that selected by the sender on the front of this Bill of Lading. Any exercise by the carrier of this right shall in no way affect the maximum liability of the carrier aforesaid. This Bill of Lading and Purolator Courier Ltd.'s printed Terms and Conditions (available on request) constitute the entire contract between the carrier and the sender, and no agent, servant, or representatives of the carrier has authority to alter, modify or waive any provision of this contract.

COURRIER PUROLATOR LTÉE - CONDITIONS DE TRANSPORT

CONDITION 1 RÉCEPTION ET FRET

Reçues au point d'origine à la date et de l'expéditeur mentionné aux présentes les marchandises ci-après décrites en bon état apparent (le contenu des colis et sa condition étant inconnus), marquées, contresignées et destinées tel que ci-après mentionné, que le transporteur consent à transporter et à livrer à leur consignataire au point de destination si ce point se trouve sur la route qu'il est autorisé à desservir, si non à faire transporter et livrer par un autre transporteur autorisé à ce faire et ce, au taux et à la classification en vigueur à la date de l'expédition.

Il est mutuellement convenu que chaque transporteur transportant lesdites marchandises en tout ou en partie, sur le parcours entier ou une portion quelconque de celui-ci jusqu'à destination et que tout intéressé à ladite expédition pour tout service à effectuer en vertu des présentes est sujet à toutes les conditions imprimées ou écrites non prohibées par la loi, incluant les conditions contenues au verso des présentes qui sont acceptées par l'expéditeur pour lui-même et ses ayants-droit.

CONDITION 2 LIMITATION DE RESPONSABILITÉ

Le transporteur n'est responsable de pertes, de dommages ou de retards aux marchandises transportées avec le présent connaissance, qu'à la condition qu'un avis écrit précisant l'origine des marchandises, leur destination, leur date d'expédition et le montant approximatif réclamé en réparation de la perte, des dommages ou du retard, ne soit signifié au transporteur initial ou au transporteur de destination, dans les soixante (60) jours suivant la date de la livraison des marchandises; ou dans les cas de non-livraison, dans un délai de neuf (9) mois suivant la date de l'expédition.

La présentation de la réclamation finie accompagnée d'une preuve du paiement des frais de transport doit être soumise au transporteur dans un délai de neuf (9) mois suivant la date de l'expédition.

CONDITION 3 LOI APPLICABLE

Le contrat pour le transport des marchandises décrites au connaissance est réputé inclure les modalités et les conditions prescrites par la loi de la province d'où provient l'envoi, à savoir, pour Terre-Neuve et la Saskatchewan, la «Motor Carrier Act» de chacune de ces provinces; pour la Nouvelle-Ecosse et la Colombie-Britannique, la «Motor Vehicle Act» de chacune de ces provinces; pour le Nouveau-Brunswick, la Loi sur les véhicules à moteur; pour l'Île-du-Prince-Édouard, la «Highway Traffic Act»; pour le Québec, la Loi sur les transports; pour l'Ontario, la Loi sur le camionnage; pour le Manitoba, le Code de la route; pour l'Alberta et le Yukon, la «Motor Transport Act» de cette province et de ce territoire; pour le Nunavut et les Territoires du Nord-Ouest, la «Motor Vehicles Act» de chacun de ces territoires; ainsi que les règlements connexes à chacune des lois précitées et y être assujettis. La Convention du 12 octobre 1929 pour l'unification de certaines règles relatives au transport aérien international signée à Varsovie, en Pologne, ou ladite Convention telle qu'elle a été modifiée par le protocole de La Haye en 1955, le Protocole de Montréal N° 4 et/ou la Convention complémentaire à la Convention de Varsovie pour l'unification de certaines règles relatives au transport aérien international effectué par une personne autre que le transporteur contractuel, qui peuvent s'appliquer au transport des envois internationaux et, dans la plupart des cas, limiteront la responsabilité de Purolator quant à la perte ou aux dommages, ou encore aux retards liés au transport, de tels envois, peut s'appliquer au transport d'envois internationaux.

CONDITION 4 ENTENTE SPÉCIALE

Il est convenu que, malgré toute divulgation de la nature ou de la valeur des marchandises, le montant de toute perte ou dommage, le cas échéant, y compris les dommages indirects, accessoires ou incidents résultant de la perte ou d'un dommage aux marchandises, d'une erreur de livraison, du défaut ou d'un retard dans la livraison des marchandises, ne doit en aucun cas excéder la responsabilité maximale précitée du transporteur.

Nonobstant toute autre condition contenue dans la présente, le transporteur ne sera pas tenu financièrement responsable des conséquences du retard de livraison d'un envoi, quelle que soit l'ampleur du retard, qu'il s'agisse d'une erreur de livraison ou d'une non-livraison.

CONDITION 5 GARANTIE DE REMBOURSEMENT

L'expéditeur convient de payer au transporteur tous les frais d'expédition si le consignataire, pour un envoi port dû, ou la tierce personne, en cas de facturation à un tiers, refuse de payer le transporteur.

CONDITION 6 DROIT RÉSERVÉ ET MODIFICATION DU CONTRAT

Le transporteur se réserve le droit de choisir un mode de transport différent de celui sélectionné par l'expéditeur au recto du présent connaissance. Tout décision prise à cet effet par le transporteur n'influencera nullement les responsabilités maximales dudit transporteur. Le présent connaissance ainsi que les modalités et les conditions de transport imprimées de Courrier Purolator Ltée (disponibles sur demande) constituent la totalité du contrat entre le transporteur et l'expéditeur. Aucun agent, employé ou représentant du transporteur ne peut modifier, changer ou abandonner une clause du présent contrat.

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD959, Rev. 0

1. NAME AND ADDRESS OF APPLICANT:

AERO Design Ltd.
9888A Malaspina Road
Powell River, BC
V8A 0G3

2. ALL CORRESPONDANCE TO:

AERO Design Ltd.
9888A Malaspina Road
Powell River, BC
V8A 0G3

3. IDENTIFICATION OF PRODUCT:

MAKE:

Bell

MODEL:

429

SERIAL No.:

All Eligible

REGISTRATION:

All Eligible

4. REQUEST FOR:

A. ☐ SUPPLEMENTAL TYPE CERTIFICATE (STC)

B. ☒ STC REVISION

STC No. **SH12-58**

Issue 2

C. ☐ LIMITED STC (LSTC)

D. ☐ LSTC REVISION

LSTC No.

See remark

Issue

E. ☐ REPAIR DESIGN CERTIFICATE (RDC)

F. ☐ RDC REVISION

RDC No.

Issue

G. ☐ F.A.A. SUPPLEMENTAL TYPE CERTIFICATE

H. ☐ FAA STC REVISION

STC No.

Issue

I. ☐ FAMILIARIZATION OF A FOREIGN TYPE DESIGN CHANGE

FAA STC # _____

EASA STC # _____

OTHER STC # _____

5. TITLE OF MODIFICATION OR REPAIR:

External Cargo Basket and Cabin Steps Installation

6. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:

Installation of quick release cargo basket, fixed cabin step, and optional quick release cabin step.

7. APPLICABLE TYPE CERTIFICATE (TC) DOCUMENTS:

A. Cdn. TC NO. H-107

B. Foreign TC No.

C. OTHER (Please specify)

8. PROPOSED BASIS OF APPROVAL:

A. SAME AS Cdn. TC ☒

B. SAME AS Foreign TC ☐

C. OTHER ☐ (Please specify)

9.

DOCUMENTATION CHECKLIST

REQUIRED

(FOR DOT USE ONLY)

RECEIVED

YES

NO

YES

NO

DATE

COMPLIANCE PROGRAM

X

X

MASTER DRAWING LIST

X

ENGINEERING REPORTS

X

MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS

X

X

WEIGHT AND MOMENT CHANGE

X

FLIGHT MANUAL SUPPLEMENT

X

INSTRUCTIONS FOR CONTINUING AIRWORTHINESS

X

AIRWORTHINESS LIMITATIONS

X

MAINTENANCE MANUAL SUPPLEMENT

X

ELECTRICAL LOAD ANALYSIS

X

FLIGHT TEST DATA

X

DESIGN DRAWINGS

X

DRAFT STC, LSTC OR RDA

X

OTHER (Specify):

10. APPLICANT'S REMARKS:

Application is for revision to technical documents without STC re-issue.

11. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

Aero Design Ltd.

PER:

[Signature]

Engineering Technologist

29 July 2013

SIGNATURE OF APPLICANT

TITLE

DATE

12.

SIGNATURE REGIONAL AIRWORTHINESS ENGINEER

TITLE

DATE

Bill yag

Approved w/ steps in TC configuration
→ configuration A allows install w/out step → will not allow

Basket height → egress in emergency cond.

TC step 16" below floor

Basket 4" below

Skid 6" inboard.

Steps

(Config A - Basket + Fixed step

B - OR step + Fixed step.

DCI 704 → yag applicable only
→ TC will have to approve

Back next week.



Transport Canada Transports Canada

#1100, 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

NOTESLIP

Date 4-Mar-13

No. of pages (including cover sheet) 4

Our File: C-12-0852
SH12-58 – Iss. 1

Your File: 959

To: AERO DESIGN LTD.

ATTN: TED BURGOIN

Phone (403) 250-8027

Fax Phone (403) 250-8333

From Debbie Dubyk

Phone 780-495-7412

Fax Phone 780-495-7963

SUBJECT: CP 959 – DAR 290M AND TCCA INITIALED

Hi Ted:

Please find enclosed Compliance Program CP959 pertaining to Approval SH12-58 – Issue 1 which has been initialed by both DAR 290M and TCCA (Jack Staal).

Provided for your records.

Thanks

Debbie Dubyk

Operational Support Assistant

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

 APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

 DATE: 06 September 2012
REV. No. 2 22 November 2012

 CORRESPONDANCE TO:
(If other than applicant)

 MAKE: Bell Helicopter
MODEL: 429

 REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

 MODEL CERTIFICATION BASIS: CAR527, Change 527-9
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-9

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|-------------------------------------|-----|-----|-------------------------------|
| Subpart B – Flight | | | | | |
| 527.27 | Centre of Gravity Limits | N/A | | | |
| 527.29 | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | X | | No change from Type Approval. |
| 527.51 | Takeoff | Flight Test | | | |
| 527.65 | Climb: All Engines Operating | Flight Test | | | |
| 527.67 | Climb: One Engine Inoperative | Flight Test | | | |
| 527.71 | Gliding Performance | Flight Test | | | |
| 527.75 | Landing | Flight Test | | | |
| 527.141 | Flight Characteristics – General | Flight Test | | | |
| 527.143 | Controllability and Maneuverability | Flight Test | | | |
| 527.171 | Stability – General | Flight Test | | | |
| 527.173 | Longitudinal Stability | Flight Test | | | |
| 527.175 | Demonstration of Longitudinal Stability | Flight Test | | | |
| 527.177 | Static Directional Stability | Flight Test | | | |
| 527.231 | Ground and Water Handling - General | Flight Test | | | |
| 527.241 | Ground Resonance | Flight Test | | | |
| 527.251 | Vibration | Flight Test | | | |
| Subpart C – Strength Requirements | | | | | |
| 527.301 | Loads – Air Drag Loads | Analysis | X | | |
| 527.301 | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | X | | |
| 527.303 | Factor of Safety | Analysis | X | | |

Flight tests to be performed on Bell 429 by
Transport Canada Flight Test and Bell
Helicopters Test Pilot on instrumented
helicopter
Per HQ - Michel Brulotte
F/T Report & emails

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|---------------------------|---|-----------------------------------|------|-----|---|
| 527.305 | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.307 | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.547 | Main Rotor Structure | Flight Test | M.B. | | Critical load factor in downward direction. See comments for flight test above |
| 527.561 | Emergency Landing Conditions | | | | |
| 527.561(a) | General | N/A | | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |

Subpart D – Design and Construction

| | | | | | |
|-----------------|--|------------------------------------|--|----|---|
| 527.601 | Design | Drawings | | X | Design is conventional. |
| 527.603 | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 | Protection of Structure | Drawings | | X | |
| 527.611 | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 | Fitting Factor | Analysis | | X | |
| 527.727 | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.783 | Doors | N/A | | | Installation does not block doors. |
| 527.787(a) | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 | External Load Attaching Means | N/A | | | Cargo basket is classified as a cargo compartment |
| 527.1387 | Position Light System Dihedral Angles | Statement | | ** | Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|--|------------------------------------|------|-------|--|
| 527.1401 | Anti-collision Light System | Statement | | ** AB | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 | Never Exceed Speed | Flight Test, | M.B. | | V _{NE} limits to be verified by flight test. |
| 527.1525 | Kinds of Operation | Flight Manual Supplement | M.B. | | |
| 527.1529 | Instructions for Continuing Airworthiness | ICA Provided | J.S. | | |
| 527.1557(a) | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | X AB | |
| 527.1557(b) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 | Rotorcraft Flight Manual – General | Flight Manual Supplement | M.B. | | |
| 527.1583(c) | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | M.B. | | |
| 527.1585 | Operating Procedures | Flight Manual Supplement | M.B. | | |
| 527.1587 | Performance Information | Flight Manual Supplement | M.B. | | |
| 527.1589 | Loading Information | Flight Manual Supplement & Placard | M.B. | | Placard installed on basket |

Note: M.B. indicates items being signed of by Michel Brulotte.

J.S. indicates items being signed of by Jack Staal.

** indicates items requiring extension of delegation.

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

07 February 2013

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File : C-13-0131

Our File : 959

Re: Bell 429 Cargo Basket and Cabin Step Installation - FAA Application

Jack,

Please find attached the following documents in support of application for an FAA STC:

| | | |
|--|------------|---------|
| Modification Approval Request Application Form | MOD959_FAA | Rev. 0 |
| FAA STC Application form 8110-12 | | |
| Transport Canada STC | SH12-58 | Issue 2 |
| Compliance Program | CP959 | Rev. 1 |
| Document Control List | DCL959-1 | Rev. 0 |
| Document Control List | DCL959-2 | Rev. 0 |
| Document Control List | DCL959-11 | Rev. 0 |
| Document Control List | DCL959-12 | Rev. 0 |
| Document Control List | DCL704 | Rev. 7 |
| Flight Manual Supplement | FMS959.90 | Rev. 0 |
| Instructions for Continued Airworthiness | ICA959.91 | Rev. 0 |
| MSI 53 Review for ICA959.91 | | |
| Engineering Report | ER959.01 | Rev. 0 |
| Engineering Report | ER959.02 | Rev. 0 |
| Flight Test Report - TCCA M. Brulotte | | |
| Drawings | | |
| Basket Installation | 95901 | Rev. 0 |
| Mounting Provisions Installation | 95902 | Rev. 0 |
| Basket Assembly | 95910 | Rev. 0 |
| Basket Body Assembly | 95911 | Rev. 0 |
| Basket List Assembly | 95912 | Rev. 0 |
| Forward Sheet | 95915 | Rev. 0 |
| Filler Sheets | 95916 | Rev. 0 |
| Lid Checker Plate | 95917 | Rev. 0 |
| Forward Fitting Fabrication | 95920 | Rev. 0 |
| Aft Fitting Fabrication | 95921 | Rev. 0 |
| Adapter Plates Fabrication | 95922 | Rev. 0 |
| Bushings Fabrication | 95923 | Rev. 0 |
| Forward Attachment Hoop | 95925 | Rev. 0 |

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

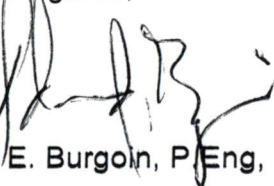
Fax: 403-250-8333

www.aerodesign.ca

| | | |
|--|-----------|--------|
| Aft Attachment Hoop | 95926 | Rev. 0 |
| Placard Fabrication | 95927 | Rev. 0 |
| Forward Beam Fabrication | 95930 | Rev. 0 |
| Aft Beam Fabrication | 95931 | Rev. 0 |
| Cabin Steps: | | |
| Compliance Program | CP969 | Rev. 0 |
| Document Control List | DCL969-1 | Rev. 0 |
| Document Control List | DCL969-11 | Rev. 0 |
| Flight Manual Supplement | FMS969.90 | Rev. 0 |
| Instructions for Continued Airworthiness | ICA969.91 | Rev. 0 |
| MSI 53 Review for ICA969.91 | | |
| Engineering Report | ER969.01 | Rev. 0 |
| Drawings | | |
| Fixed Step Installation | 96901 | Rev. 0 |
| Quick Release Step Installation | 96902 | Rev. 0 |
| Fixed Step Assembly | 96910 | Rev. 0 |
| Quick Release Step Assembly | 96911 | Rev. 0 |
| Bracket Fabrication | 96920 | Rev. 0 |
| Bracket Fabrication | 96921 | Rev. 0 |
| Quick Release Step Assembly (Alternate) | 80010 | Rev. 1 |
| Bracket Fabrication | 80020 | Rev. 0 |

Three copies of the above files are included on CDs for submission to the FAA.

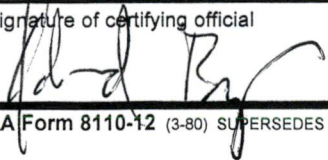
Regards,



E. Burgoin, P.Eng, DAR 290M

Encl.

No certificate may be issued unless a completed application form has been received (14 C.F.R. 21)

| DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION | | FORM APPROVED O.M.B. No. 04-R0078 |
|---|--|--|
| APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE CERTIFICATE | | |
| 1. Name and address of applicant AERO Design Ltd. 2013 39 th Avenue NE Calgary, Alberta, Canada T2E 6R7 | 2. Application made for - <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input checked="" type="checkbox"/> Supplemental Type Certificate | 3. Product involved <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller |
| 4. TYPE CERTIFICATE (Complete item 4a below) | | |
| a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material, specifications, construction, and performance of the aircraft, aircraft engine, propeller which is the subject of this application.) | | |
| 5. PRODUCTION CERTIFICATE (Complete items 5a-c below. Submit with this form, in manual form, one copy of quality control data or changes thereto covering new products, as required by applicable FAR.) | | |
| a. Factory address (If different from 1 above) | b. Application is for - <input type="checkbox"/> New Production Certificate <input type="checkbox"/> Additions to Production Certificate (Give P.C. No.) | P.C. No. |
| c. Applicant is holder of or a licensee under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number) | | T.C./S.T.C. No. |
| 6. SUPPLEMENTAL TYPE CERTIFICATE (Complete items 6a-d below) | | |
| a. Make and model designation of product to be modified Bell 429 (TCDS R00003RD, Canadian TCDS H-107) | | |
| b. Description of modification Installation of quick release cargo basket on Bell 429. Installation is similar to Bell 206L/407 configuration. Basket is same size as existing Bell 206L/407 ski basket, with the primary difference being the lack of a cutout for the aft cross tube. The basket mounts to the fuselage using the existing hardpoints for the cabin step. The step is removed and aluminum fittings are installed. The mounting beam then attaches to the fittings. Cabin steps may be installed on the mounting beams for the basket. | | |
| c. Will data be available for sale or release to other persons? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | d. Will parts be manufactured for sale? (Ref. FAR 21.303) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | |
| 7. CERTIFICATION - I certify that the above statements are true. | | |
| Signature of certifying official  | Title DAR 290M | Date 07 February 2013 |

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD959_FAA, Rev. 0

| | |
|--|--|
| 1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7 | 2. ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 - 39th Avenue NE Calgary, Alberta T2E 6R7 |
|--|--|

| | | | |
|--|----------------------|------------------------------------|--------------------------------------|
| 3. IDENTIFICATION OF PRODUCT: MAKE: Bell | MODEL: 429 | SERIAL No.: All eligible | REGISTRATION: All eligible |
|--|----------------------|------------------------------------|--------------------------------------|

4. REQUEST FOR:

| | | | |
|---|--|----------|-------|
| A. <input type="checkbox"/> SUPPLEMENTAL TYPE CERTIFICATE (STC) | B. <input type="checkbox"/> STC REVISION | STC No. | Issue |
| C. <input type="checkbox"/> LIMITED STC (LSTC) | D. <input type="checkbox"/> LSTC REVISION | LSTC No. | Issue |
| E. <input type="checkbox"/> REPAIR DESIGN CERTIFICATE (RDC) | F. <input type="checkbox"/> RDC REVISION | RDC No. | Issue |
| G. <input checked="" type="checkbox"/> F.A.A. SUPPLEMENTAL TYPE CERTIFICATE | H. <input type="checkbox"/> FAA STC REVISION | STC No. | Issue |
| I. <input type="checkbox"/> FAMILIARIZATION OF A FOREIGN TYPE DESIGN CHANGE | | | |

FAA STC # _____ EASA STC # _____ OTHER STC # _____

5. TITLE OF MODIFICATION OR REPAIR:
 Installation of External Attachment Provisions, Cargo Basket, and Cabin Steps

6. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:
 Installation of external attachment provisions and mounting beams on existing cabin step hard points, installation of cargo basket on mounting beams, installation of cabin steps on mounting beams.

7. APPLICABLE TYPE CERTIFICATE (TC) DOCUMENTS:
 A. Cdn. TC NO. H-107 B. Foreign TC No. R00003RD C. OTHER (Please specify) EASA.IM.R.506

8. PROPOSED BASIS OF APPROVAL:
 A. SAME AS Cdn. TC ☒ B. SAME AS Foreign TC ☐ C. OTHER ☐ (Please specify)

| 9. DOCUMENTATION CHECKLIST | REQUIRED | | (FOR DOT USE ONLY) RECEIVED | | |
|--|----------|----|--------------------------------|----|------|
| | YES | NO | YES | NO | DATE |
| COMPLIANCE PROGRAM | X | | | | |
| MASTER DRAWING LIST | X | | | | |
| ENGINEERING REPORTS | X | | | | |
| MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS | X | | | | |
| WEIGHT AND MOMENT CHANGE | X | | | | |
| FLIGHT MANUAL SUPPLEMENT | X | | | | |
| INSTRUCTIONS FOR CONTINUING AIRWORTHINESS | X | | | | |
| AIRWORTHINESS LIMITATIONS | | X | | | |
| MAINTENANCE MANUAL SUPPLEMENT | | X | | | |
| ELECTRICAL LOAD ANALYSIS | | X | | | |
| FLIGHT TEST DATA | X | | | | |
| DESIGN DRAWINGS | | X | | | |
| DRAFT STC, LSTC OR RDA | | X | | | |
| OTHER (Specify): | | | | | |

10. APPLICANT'S REMARKS:
 Based on TCCA STC SH12-58, issue 2. EASA accepted, STC 10043360.

11. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

| | | |
|--------------------------------|---------------------|--------------------------|
| PER: SIGNATURE OF APPLICANT | Consultant TITLE | 07 February 2013 DATE |
|--------------------------------|---------------------|--------------------------|

12.

| | | |
|---|-------|------|
| SIGNATURE REGIONAL AIRWORTHINESS ENGINEER | TITLE | DATE |
|---|-------|------|

Jeff Clarke

From: Wuttke Claudia [claudia.wuttke@easa.europa.eu] on behalf of STC [stc@easa.europa.eu]
Sent: January 7, 2013 5:21 AM
To: Jeff Clarke
Cc: ROMANO Max; 'Staal, Jack'; 'Ted Burgoin'
Subject: RE: Project # 0010020992-001 - Bell 429 Ski Basket Installation



Aero Design Ltd.
0010020992 re...

Dear Mr Clarke,

Thank you for submitting the revised application form for EASA Project N° 0010020992. Please be informed that all amendments are done. Herewith please find the revised EASA Application Acceptance Letter.

Kind regards,
Claudia Wuttke

Best regards, meilleures salutations, mit freundlichen Grüßen

Claudia Wuttke

Applications & Procurement Services Department European Aviation Safety Agency (EASA)
Tel: + 49 (0) 221 89990 4071
Fax: + 49 (0) 221 89990 4571
E-mail: claudia.wuttke@easa.europa.eu
Post: Postfach 10 12 53, D-50452 Cologne, Germany
Visitor: Ottoplatz 1, D-50679 Cologne, Germany
Web: www.easa.europa.eu

-----Original Message-----

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: 04 January 2013 16:44
To: Wuttke Claudia; new.applications
Cc: ROMANO Max; 'Staal, Jack'; 'Ted Burgoin'
Subject: Project # 0010020992-001 - Bell 429 Ski Basket Installation

Hello,

Please find attached a revised application form for project 0010020992-001. This is an administrative change requested by the PCM, see email below.

Regards,

Jeff Clarke, CET

AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, Canada

T2E 6R7

Phone: 403.250.8027

Fax: 403.250.8333

From: ROMANO Max [mailto:massimiliano.romano@easa.europa.eu]
Sent: January 3, 2013 11:45 PM
To: Jeff Clarke
Subject: RE: Project # 0010020992-001 - Bell 429 Ski Basket Installation

Jeff,

Just amend the previous EASA application with the new approval issue # (field 5) and description (field 6). Make sure to mention the project # and explain that it is only an administrative change requested by the PCM, so you won't be charged twice.

*However, you do need to amend field 4 as well. You need to tick "Large Rotorcraft (CS-27 Cat. A)".

Make sure to CC me when you send it to EASA

Thanks,

Max

Max Romano

Project Certification Manager

Rotorcraft, Balloons and Airships Section

CERTIFICATION DIRECTORATE

European Aviation Safety Agency (EASA)

Agence Européenne de la Sécurité Aérienne

Europäische Agentur für Flugsicherheit

Tel: +49 221 89990 4345

Fax: +49 221 89990 4845

Mob.: +49 151 4670-4270

max.romano@easa.europa.eu <mailto:max.romano@easa.europa.eu>

www.easa.europa.eu <http://www.easa.europa.eu/>

Visitors: Ottoplatz 1, D-50679

Köln, Deutschland

Jeff Clarke

From: ROMANO Max [massimiliano.romano@easa.europa.eu]
Sent: January 3, 2013 11:45 PM
To: Jeff Clarke
Subject: RE: Project # 0010020992-001 - Bell 429 Ski Basket Installation

Jeff,

Just amend the previous EASA application with the new approval issue # (field 5) and description (field 6). Make sure to mention the project # and explain that it is only an administrative change requested by the PCM, so you won't be charged twice.

*However, you do need to amend field 4 as well. You need to tick "Large Rotorcraft (CS-27 Cat. A)".

Make sure to CC me when you send it to EASA

Thanks,

Max

Max Romano

Project Certification Manager
Rotorcraft, Balloons and Airships Section
CERTIFICATION DIRECTORATE
European Aviation Safety Agency (EASA)
Agence Européenne de la Sécurité Aérienne
Europäische Agentur für Flugsicherheit
Tel: +49 221 89990 4345
Fax: +49 221 89990 4845
Mob.: +49 151 4670-4270
max.romano@easa.europa.eu
www.easa.europa.eu
Visitors: Ottoplatz 1, D-50679
Köln, Deutschland

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: 20 December 2012 00:42
To: ROMANO Max
Subject: RE: Project # 0010020992-001 - Bell 429 Ski Basket Installation

Max,

We have added a new configuration to the 429 cargo basket and reissued the Canadian STC. The new configuration is for passenger steps because the original Bell steps are removed by the basket installation. The approval data is attached. Installation drawings to follow. Will we be able to add this to the EASA approval before it is issued?

Thank you,

Jeff Clarke, CET

AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, Canada
T2E 6R7

Phone: 403.250.8027
Fax: 403.250.8333

**Application for Supplemental Type Certificate****1 Applicant**

Data protection: Personal data included in the application related to the "Application for Supplemental Type Certificate" is processed by EASA pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It will be processed solely for the purposes of the performance, management and follow-up of the Application by the Agency, without prejudice to possible transmission to internal audit services, to the Court of Auditors, to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the European Union. The Applicant shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Applicant have any queries concerning the processing of his personal data, he shall address them to the Agency at the following address: dpo@easa.europa.eu. The Applicant shall have right of recourse at any time to the European Data Protection Supervisor.

1.1 Applicant Data**1.1.1 Customer Number** 300116**1.1.2 Applicant Name** AERO Design Ltd.**1.1.3 Address**
(registered business address)

| | |
|-------------|---------------------------------|
| Street / Nr | 2013 39 th Avenue NE |
| Post Code | T2E 6R7 |
| City | Calgary, Alberta |
| Country | Canada |

1.1.4 Contact Person
(responsible for this application)

| | |
|------------|--|
| Title | <input checked="" type="checkbox"/> Mr <input type="checkbox"/> Ms |
| Name | Clarke |
| First name | Jeff |
| Job title | Engineering Technologist |
| Phone/Fax | Phone: 403-250-8027 Fax: 403-250-8333 |
| Email | jeff@aerodesign.ca |

1.2 Certificate Address
(To be printed onto the Certificate)☒ Same as Applicant Data in section 1.1 (→continue with section 1.3)**1.2.1 Applicant Name**☐ Same as in section 1.1.2 Applicant Name☐ Other (please specify below)

Name

1.2.2 Certificate Address
(registered business address)☐ Same as in section 1.1.3 Address☐ Other (please specify below)

Street / Nr

Post Code

City

Country

**Application for Supplemental Type Certificate**

| | | | |
|---|--|--|--|
| 1.3 Billing Data | | <input type="checkbox"/> Same as Applicant Data in section 1.1 (→continue with section 1.3.4) | |
| 1.3.1 Applicant Name | <input checked="" type="checkbox"/> Same as in section 1.1.2 Applicant Name (other name only in exceptional cases) | | |
| 1.3.2 Billing Address | <input checked="" type="checkbox"/> Same as in section 1.1.3 Address | | <input type="checkbox"/> Other (please specify below) |
| | Street / Nr | | |
| | PO Box | | |
| | Post Code | | |
| | City | | |
| | Country | | |
| 1.3.3 Contact Person (Financial) | <input type="checkbox"/> Same as in section 1.1.4 Contact Person | | <input checked="" type="checkbox"/> Other (please specify below) |
| | Title | <input checked="" type="checkbox"/> Mr <input type="checkbox"/> Ms | |
| | Name | Burgoin | |
| | First name | Charles | |
| | Job title | President | |
| | Phone/Fax | Phone: 403-250-8027 Fax: 403-250-8333 | |
| 1.3.4 Financial Contact Email Invoice PDF copy will be sent to this address | | jeff@aerodesign.ca ; ted@aerodesign.ca | |
| 1.4 Certificate Delivery Data | | <input checked="" type="checkbox"/> Same as Applicant Data in section 1.1 (→continue with section 2) | |
| 1.4.1 Applicant Name | <input type="checkbox"/> Same as in section 1.1.2 Applicant Name | | <input type="checkbox"/> Other (please specify below) |
| | Name | | |
| 1.4.2 Delivery Address | <input type="checkbox"/> Same as in section 1.1.3 Address | | <input type="checkbox"/> Other (please specify below) |
| | Street / Nr | | |
| | PO Box | | |
| | Post Code | | |
| | City | | |
| | Country | | |
| 1.4.3 Contact Person (Certificate Delivery) | <input type="checkbox"/> Same as in section 1.1.4 Contact Person | | <input type="checkbox"/> Other (please specify below) |
| | Title | <input type="checkbox"/> Mr <input type="checkbox"/> Ms | |
| | Name | | |
| | First name | | |
| | Job title | | |
| | Phone/Fax | | |
| | Email | | |

**Application for Supplemental Type Certificate****2. Applicant's Reference** (Please provide an individual reference to this application)

Your reference

959

3. Identification of Activity☒ Supplemental Type Certificate☒ Simple☐ Standard☐ Complex☐ Administrative re-issuance of an approved STC

Including change to approved parts of Flight Manual (FM)

☒ Yes☐ No**Important Note:**

For **Revisions to STC**, please complete **EASA Form FO.TCCH.00031** or **EASA Form FO.TCCH.00032**, as applicable.
For **Transfer of Certificate** please complete **EASA Form FO.TC.00038**.

4. Product Identification**4.1 Fees & Charges Information****Large Aeroplane**

- ☐ > 150 000 kg
☐ > 50 000 kg ≤ 150 000 kg
☐ > 22 000 kg ≤ 50 000 kg
☐ > 5 700 kg ≤ 22 000 kg (excluding commuter)

General Aviation

- ☐ > 5 700 kg ≤ 22 000 kg (incl. commuter)
☐ > 2 000 kg ≤ 5 700 kg
☐ ≤ 2 000 kg
☐ VLA, powered sailplanes, sailplanes
☐ LSA

Rotorcraft, Balloons & Airships

- ☐ Large Rotorcraft (CS-29)
☒ Large Rotorcraft (CS-27 Cat. A)
☐ Medium Rotorcraft (other CS-27)
☐ Small Rotorcraft (CS-27 with MTOW < 3.175 Kg and limited to 4 seats)
☐ Small Rotorcraft (VLR)
☐ Balloon
☐ Airship

Propulsion

- ☐ Turbine Engine > 25 kN take-off thrust
☐ Turbine Engine ≤ 25 kN take-off thrust
☐ Turbine Engine > 2000 kW take-off power
☐ Turbine Engine ≤ 2000 kW take-off power
☐ Non-Turbine Engine
☐ CS-22H class engine
☐ CS VLR App. B
☐ APU
☐ Propeller for use on aircraft > 5 700 kg MTOW
☐ Propeller for use on aircraft ≤ 5 700 kg MTOW
☐ CS-22J class propeller

**Application for Supplemental Type Certificate**

| | | |
|--|-------------------------|--|
| 4.2 Applicability | Type Certificate Number | IM.R.506 (Canadian Type Certificate H-107) |
| | Type Certificate Holder | Bell Helicopter Textron Canada Ltd. |
| | Type | Rotorcraft |
| | Model(s) | 429 |
| 4.3 Applicable Airworthiness Code | | |

5. Original Approval(if applicable)

| | | |
|--------------------------------------|-----------------|------------------|
| 5.1 Third Country Approval N° | Approval Number | SH12-58, Issue 2 |
| | Issued by | Transport Canada |
| | Issued on | 19 December 2012 |

6. Description

| | |
|--|---|
| 6.1 Title | Installation of External Attachment Provisions, Cargo Basket, and Cabin Steps. |
| 6.2 Description | Installation of attachment fittings on the existing hard points for the cabin step. Installation of mounting beams on the attachment fittings. Installation of cargo basket on mounting beams. Installation of cabin access steps on the mounting provisions. |
| 6.3 Affected Areas (including manuals) | See compliance program CP959, revision 2; Flight Manual, Instructions for Continued Airworthiness See compliance program CP969, revision 0; Flight Manual, Instructions for Continued Airworthiness |
| 6.4 Re-Investigations | None |
| 6.5 Justification | Transport Canada has issued an STC; STC was developed with support from Type Certificate holder, Bell Helicopter Textron Canada Ltd. |

**Application for Supplemental Type Certificate****7. Part 21 demonstration of eligibility**

I declare that this application is:

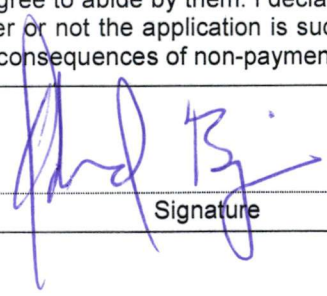
| | | |
|---|------------------|----------|
| <input type="checkbox"/> Within the current approved scope of work of (A)DOA | (A)DOA Reference | |
| <input type="checkbox"/> Following an application for Design Organisation Approval (DOA) or Alternative Procedures to Design Organisation Approval (ADOA) | Application Date | |
| | Project N° | if known |
| <input type="checkbox"/> Following an application for a change to the scope of work via EASA Form FO.DOA.00081 or FO.DOA.00082 | Application Date | |
| | Project N° | if known |
| <input checked="" type="checkbox"/> Without an application for DOA (only for Non EU organisations, as applicable) | | |

8. Applicant's declaration and acceptance of the General Conditions and Terms of Payment

I declare that I have the legal capacity to submit this application to EASA and that all information provided in this application form is correct and complete.

I have understood that I am submitting an application for which fees or charges will be levied by EASA in accordance with the Commission Regulation (EC) No. 593/2007 of 31 May 2007 on the fees and charges levied by the European Aviation Safety Agency, as last amended and available from <http://easa.europa.eu/> Legislation > Fees & Charges.

I acknowledge that I have read and understood the Agency's Terms of Payment (see <http://easa.europa.eu/> Legislation > Fees & Charges>General Conditions and Terms of Payment) and agree to abide by them. I declare to be aware that fees or charges, as well all relevant travel costs must be paid whether or not the application is successful and that they might not be refundable. Moreover, I declare that I am aware of the consequences of non-payment.

| | | |
|---|---------------|---|
| 04 January 2013 Calgary, Alberta, Canada | C. E. Burgoin |  |
| Date/Place | Name | Signature |

This Application should be sent by fax, e-mail or regular mail to:

European Aviation Safety Agency
Applications and Procurement Services Department
Postfach 10 12 53
D-50452 Köln
Germany

Fax: +49 (0)221 89990 ext. 4446

E-mail: STC@easa.europa.eu

Important Note: EASA cannot accept applications without signature. Please make sure that you sign the application.

First Time applicants at EASA need to submit a copy of their article/certificate of incorporation (if applicable) together with the application form.

AERO Design Ltd.
(403) 250-8027

2013 - 39th Avenue NE
Calgary, Alberta, T2E 6R7

PACKING SLIP
17 December 2012

Address:

Bell Helicopter Textron Canada Ltd.
12 800 rue de l'Avenir
Mirabel, QC
J7J 1R4

Attention:

Geoff Bliss

Phone #:

450-971-6500 ext. 2098

We hereby declare that the parts supplied herein do conform with the referenced drawings. Use and installation of the parts may require further approval, and shall also comply with applicable airworthiness standards.


Signature

Product: Bell 429 Cabin Steps

Reference: Your Purchase Order #: _____

Documents Included with this Shipment:

| | | |
|----------------------|--------------|-------------------|
| Installation Drawing | <u>95901</u> | <u>Revision 0</u> |
| Installation Drawing | <u>95902</u> | <u>Revision 0</u> |

Parts and Assemblies Included with this Shipment:

| Quantity Ordered | Quantity Shipped | Part Number | Description |
|------------------|------------------|---------------|---|
| 1 | 1 | 96901-01-02 | Fixed Cabin Step Installation, Bell 429 |
| 1 | 1 | 96910-01 | Fixed Step Assembly |
| 4 | 4 | AN4-14A | Bolt |
| 8 | 8 | NAS1149F0463P | Washer |
| 4 | 4 | MS21044N4 | Nut |
| 1 | 1 | 96902-01-01 | Quick Release Cabin Step Installation, Bell 429 |
| 1 | 1 | 96911-01 | Quick Release Step Assembly |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 06 September 2012
REV. No. 2 22 November 2012

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 429

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: CAR527, Change 527-9
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-9



| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|-------------------------------------|------|-----|--|
| Subpart B – Flight | | | | | |
| 527.27 | Centre of Gravity Limits | N/A | | | |
| 527.29 | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | X | | No change from Type Approval. |
| 527.51 | Takeoff | Flight Test | M.B. | } | Flight tests to be performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter per HQ flight test. (M. Brulotte). |
| 527.65 | Climb: All Engines Operating | Flight Test | M.B. | | |
| 527.67 | Climb: One Engine Inoperative | Flight Test | M.B. | | |
| 527.71 | Gliding Performance | Flight Test | M.B. | | |
| 527.75 | Landing | Flight Test | M.B. | | |
| 527.141 | Flight Characteristics – General | Flight Test | M.B. | | |
| 527.143 | Controllability and Maneuverability | Flight Test | M.B. | | |
| 527.171 | Stability – General | Flight Test | M.B. | | |
| 527.173 | Longitudinal Stability | Flight Test | M.B. | | |
| 527.175 | Demonstration of Longitudinal Stability | Flight Test | M.B. | | |
| 527.177 | Static Directional Stability | Flight Test | M.B. | | |
| 527.231 | Ground and Water Handling - General | Flight Test | M.B. | | |
| 527.241 | Ground Resonance | Flight Test | M.B. | | |
| 527.251 | Vibration | Flight Test | M.B. | | |
| Subpart C – Strength Requirements | | | | | |
| 527.301 | Loads – Air Drag Loads | Analysis | X | } | |
| 527.301 | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | X | | |
| 527.303 | Factor of Safety | Analysis | X | | |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|---------------------------|---|-----------------------------------|------|-----|--|
| 527.305 | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | Critical load factor in downward direction. See comments for <u>flight test</u> above |
| 527.307 | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.547 | Main Rotor Structure | Flight Test | M.B. | | |
| 527.561 | Emergency Landing Conditions | | | | |
| 527.561(a) | General | N/A | | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |

Subpart D – Design and Construction

| | | | | | |
|-----------------|--|------------------------------------|--|----|---|
| 527.601 | Design | Drawings | | X | Design is conventional. |
| 527.603 | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 | Protection of Structure | Drawings | | X | |
| 527.611 | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 | Fitting Factor | Analysis | | X | |
| 527.727 | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.783 | Doors | N/A | | | Installation does not block doors. |
| 527.787(a) | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 | External Load Attaching Means | N/A | | | Cargo basket is classified as a cargo compartment |
| 527.1387 | Position Light System Dihedral Angles | Statement | | ** | Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|--|------|----------------|--|
| 527.1401 | Anti-collision Light System | Statement | | ** <i>AB</i> | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 | Never Exceed Speed | Flight Test, | M.B. | <i>AB</i> | V _{NE} limits to be verified by flight test. <i>per HQ F/T.</i> |
| 527.1525 | Kinds of Operation | Flight Manual Supplement | M.B. | | |
| 527.1529 | Instructions for Continuing Airworthiness | Flight Manual Supplement ICA Provided | J.S. | | |
| 527.1557(a) | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | <i>AB</i> X | |
| 527.1557(b) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 | Rotorcraft Flight Manual – General | Flight Manual Supplement | M.B. | <i>AB</i> | <i>per HQ recommend.</i> |
| 527.1583(c) | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | M.B. | | |
| 527.1585 | Operating Procedures | Flight Manual Supplement | M.B. | | |
| 527.1587 | Performance Information | Flight Manual Supplement | M.B. | | |
| 527.1589 | Loading Information | Flight Manual Supplement & Placard | M.B. | | Placard installed on basket |

Note: M.B. indicates items being signed of by Michel Brulotte.
 J.S. indicates items being signed of by Jack Staal.
 ** indicates items requiring extension of delegation.

in start

→ Read 2

- Read 28

3M 8663 Erosion

Tape Matte Black

Cage code 52152

Basket Assy 62 lb \rightarrow no walkway
w/handle etc.)
70 lb w/walkway

Beams - 14.6 lb each - includes plates
and hardware

Fittings 0.6 lb Fwd
0.8 lb Aft

Barb Priestly @ HAC

71.2 lb.

WEIGHT INCREASE
DUE TO MOODS

PLUS

9.2

$$\frac{25 \times 16.75 \times 5.2}{75.5 \times 22}$$

(1.3)

REMOVE FRONT MESH

KNIVES

100% BAG

.2

FRONT

$$25 \times 16 \frac{3}{4} \times 0.050 \times 0.1$$

2.1

SKIP

$$\frac{18}{3.75 \times 96 \times 0.050 \times 0.1 \times 2}$$

1.8

REMOVE LID MESH

$$5.2 \times \frac{96}{75.5} =$$

(6.6)

CHARGE

13.0

13.0



Application for Supplemental Type Certificate

1 Applicant

Data protection: Personal data included in the application related to the "Application for Supplemental Type Certificate" is processed by EASA pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It will be processed solely for the purposes of the performance, management and follow-up of the Application by the Agency, without prejudice to possible transmission to internal audit services, to the Court of Auditors, to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the European Union. The Applicant shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Applicant have any queries concerning the processing of his personal data, he shall address them to the Agency at the following address: dpo@easa.europa.eu. The Applicant shall have right of recourse at any time to the European Data Protection Supervisor.

1.1 Applicant Data

1.1.1 Customer Number

1.1.2 Applicant Name

AERO Design Ltd.

1.1.3 Address

(registered business address)

Street / Nr 2013 39th Avenue NE

Post Code T2E 6R7

City Calgary, Alberta

Country Canada

1.1.4 Contact

Person(responsible for this application)

Title ☒ Mr ☐ Ms

Name Clarke

First name Jeff

Job title Engineering Technologist

Phone/Fax Phone:403-250-8027 Fax: 403-250-8333

Email jeff@aerodesign.ca

1.2 Certificate Address

(To be printed onto the Certificate)

☒ Same as Applicant Data in section 1.1 (→continue with section 1.3)

1.2.1 Applicant Name

☐ Same as in section 1.1.2 Applicant Name☐ Other (please specify below)

Name

1.2.2 Certificate Address

(registered business address)

☐ Same as in section 1.1.3 Address☐ Other (please specify below)

Street / Nr

Post Code

City

Country

**Application for Supplemental Type Certificate**

| | | | |
|---|--|--|--|
| 1.3 Billing Data | | <input type="checkbox"/> Same as Applicant Data in section 1.1 (→continue with section 1.3.4) | |
| 1.3.1 Applicant Name | <input checked="" type="checkbox"/> Same as in section 1.1.2 Applicant Name (other name only in exceptional cases) | | |
| 1.3.2 Billing Address | <input checked="" type="checkbox"/> Same as in section 1.1.3 Address | | <input type="checkbox"/> Other (please specify below) |
| | Street / Nr | | |
| | PO Box | | |
| | Post Code | | |
| | City | | |
| | Country | | |
| 1.3.3 Contact Person (Financial) | <input type="checkbox"/> Same as in section 1.1.4 Contact Person | | <input checked="" type="checkbox"/> Other (please specify below) |
| | Title | <input checked="" type="checkbox"/> Mr <input type="checkbox"/> Ms | |
| | Name | Burgoin | |
| | First name | Charles | |
| | Job title | President | |
| | Phone/Fax | Phone: 403-250-8027 Fax: 403-250-8333 | |
| | 1.3.4 Financial Contact Email Invoice PDF copy will be sent to this address | | jeff@aerodesign.ca ; ted@aerodesign.ca |
| 1.4 Certificate Delivery Data | | <input checked="" type="checkbox"/> Same as Applicant Data in section 1.1 (→continue with section 2) | |
| 1.4.1 Applicant Name | <input type="checkbox"/> Same as in section 1.1.2 Applicant Name | | <input type="checkbox"/> Other (please specify below) |
| | Name | | |
| 1.4.2 Delivery Address | <input type="checkbox"/> Same as in section 1.1.3 Address | | <input type="checkbox"/> Other (please specify below) |
| | Street / Nr | | |
| | PO Box | | |
| | Post Code | | |
| | City | | |
| | Country | | |
| 1.4.3 Contact Person (Certificate Delivery) | <input type="checkbox"/> Same as in section 1.1.4 Contact Person | | <input type="checkbox"/> Other (please specify below) |
| | Title | <input type="checkbox"/> Mr <input type="checkbox"/> Ms | |
| | Name | | |
| | First name | | |
| | Job title | | |
| | Phone/Fax | | |
| | Email | | |

**Application for Supplemental Type Certificate****2. Applicant's Reference** (Please provide an individual reference to this application)

Your reference

959

3. Identification of Activity☒ Supplemental Type Certificate☒ Simple☐ Standard☐ Complex☐ Administrative re-issuance of an approved STC

Including change to approved parts of Flight Manual (FM)

☒ Yes☐ No**Important Note:**For **Revisions to STC**, please complete **EASA Form FO.TCCH.00031** or **EASA Form FO.TCCH.00032**, as applicable.For **Transfer of Certificate** please complete **EASA Form FO.TC.00038**.**4. Product Identification****4.1 Fees & Charges Information****Large Aeroplane**☐ > 150 000 kg☐ > 50 000 kg ≤ 150 000 kg☐ > 22 000 kg ≤ 50 000 kg☐ > 5 700 kg ≤ 22 000 kg (excluding commuter)**General Aviation**☐ > 5 700 kg ≤ 22 000 kg (incl. commuter)☐ > 2 000 kg ≤ 5 700 kg☐ ≤ 2 000 kg☐ VLA, powered sailplanes, sailplanes☐ LSA**Rotorcraft, Balloons & Airships**☐ Large Rotorcraft (CS-29)☐ Large Rotorcraft (CS-27 Cat. A)☒ Medium Rotorcraft (other CS-27)☐ Small Rotorcraft (CS-27 with MTOW < 3.175 Kg and limited to 4 seats)☐ Small Rotorcraft (VLR)☐ Balloon☐ Airship**Propulsion**☐ Turbine Engine > 25 kN take-off thrust☐ Turbine Engine ≤ 25 kN take-off thrust☐ Turbine Engine > 2000 kW take-off power☐ Turbine Engine ≤ 2000 kW take-off power☐ Non-Turbine Engine☐ CS-22H class engine☐ CS VLR App. B☐ APU☐ Propeller for use on aircraft > 5 700 kg MTOW☐ Propeller for use on aircraft ≤ 5 700 kg MTOW☐ CS-22J class propeller

**Application for Supplemental Type Certificate**

| | | |
|--|-------------------------|--|
| 4.2 Applicability | Type Certificate Number | IM.R.506 (Canadian Type Certificate H-107) |
| | Type Certificate Holder | Bell Helicopter Textron Canada Ltd. |
| | Type | Rotorcraft |
| | Model(s) | 429 |
| 4.3 Applicable Airworthiness Code | | |

| | | |
|---|-----------------|------------------|
| 5. Original Approval (if applicable) | | |
| 5.1 Third Country Approval N° | Approval Number | SH12-58 |
| | Issued by | Transport Canada |
| | Issued on | 16 November 2012 |

| | |
|--|--|
| 6. Description | |
| 6.1 Title | Installation of External Attachment Provisions and Cargo Basket. |
| 6.2 Description | Installation of attachment fittings on the existing hard points for the cabin step. Installation of mounting beams on the attachment fittings. Installation of cargo basket on mounting beams. |
| 6.3 Affected Areas (including manuals) | See compliance program CP959, revision 1; Flight Manual, Instructions for Continued Airworthiness |
| 6.4 Re-Investigations | None |
| 6.5 Justification | Transport Canada has issued an STC; STC was developed with support from Type Certificate holder, Bell Helicopter Textron Canada Ltd. |

**Application for Supplemental Type Certificate****7. Part 21 demonstration of eligibility**

I declare that this application is:

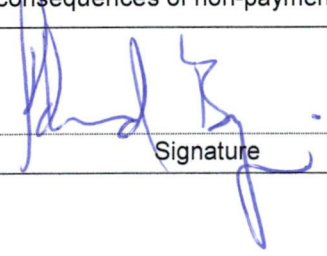
| | | |
|---|------------------|----------|
| <input type="checkbox"/> Within the current approved scope of work of (A)DOA | (A)DOA Reference | |
| <input type="checkbox"/> Following an application for Design Organisation Approval (DOA) or Alternative Procedures to Design Organisation Approval (ADOA) | Application Date | |
| | Project N° | if known |
| <input type="checkbox"/> Following an application for a change to the scope of work via EASA Form FO.DOA.00081 or FO.DOA.00082 | Application Date | |
| | Project N° | if known |
| <input checked="" type="checkbox"/> Without an application for DOA (only for Non EU organisations, as applicable) | | |

8. Applicant's declaration and acceptance of the General Conditions and Terms of Payment

I declare that I have the legal capacity to submit this application to EASA and that all information provided in this application form is correct and complete.

I have understood that I am submitting an application for which fees or charges will be levied by EASA in accordance with the Commission Regulation (EC) No. 593/2007 of 31 May 2007 on the fees and charges levied by the European Aviation Safety Agency, as last amended and available from <http://easa.europa.eu/> Legislation > Fees & Charges.

I acknowledge that I have read and understood the Agency's Terms of Payment (see <http://easa.europa.eu/> Legislation > Fees & Charges>General Conditions and Terms of Payment) and agree to abide by them. I declare to be aware that fees or charges, as well all relevant travel costs must be paid whether or not the application is successful and that they might not be refundable. Moreover, I declare that I am aware of the consequences of non-payment.

| | | |
|--|---------------|---|
| 22 November 2012 Calgary, Alberta, Canada | C. E. Burgoin |  |
| Date/Place | Name | Signature |

This Application should be sent by fax, e-mail or regular mail to:

European Aviation Safety Agency
Applications and Procurement Services Department
Postfach 10 12 53
D-50452 Köln
Germany

Fax: +49 (0)221 89990 ext. 4446

E-mail: STC@easa.europa.eu**Important Note:** EASA cannot accept applications without signature. Please make sure that you sign the application.**First Time applicants** at EASA need to submit a copy of their article/certificate of incorporation (if applicable) together with the application form.



Application for Supplemental Type Certificate



Application for Supplemental Type Certificate

Completion Instructions for FO.STC.00033

This Application Completion Instruction Sheet will provide you with any additional instructions and requirements necessary to complete the Application for Supplemental Type Certificate. It is strongly recommended to use the English language. Please complete the form in a **clearly legible** way.

Chapter 1: Applicant

- 1.1.1 If known, please enter your EASA customer number. This number follows the pattern 3XXXXX and can be found on any application acceptance letter received for previous applications.
- 1.1.2 Please enter the full **name of the company** as it appears on the Article/Certificate of incorporation of the company. If applicable also enter the Trade Name, Doing-business-as and the company registration number. In case the applicant is not a company but a **natural person**, please enter the full name as it appears in your ID Card/Passport.
In case this is your first application to EASA, please submit a copy of the article/certificate of incorporation together with the application form. This does not apply in case the applicant is a natural person.
- 1.1.3 Please enter the address of the registered office as it appears on the Article/Certificate of incorporation of the company. In case the applicant is not a company but natural person, please enter the address at which you are registered.
- 1.1.4 The name and contact details specified in this section are those of the person responsible for the application.
- 1.2.1 The (company) name specified in this section will be printed on the approval/certificate EASA will issue.
- 1.2.2 The address specified in this section, the registered business address, will be printed on the approval/certificate EASA will issue.
- 1.3.1 The (company) name specified in this section will be printed on the invoice/s EASA will issue.
- 1.3.2 The address specified in this section will be printed on the invoice/s EASA will issue.
- 1.3.3 The name and contact details specified in this section are those of the person that will be contacted for all issue connected with the EASA invoices. (e.g. accounts payable clerk).
- 1.3.4 The email specified here will be used to dispatch electronic versions of EASA invoices.
- 1.4.1 The (company) name specified in this section is where EASA will send the original certificate/approval.
- 1.4.2 The address specified in this section is where EASA will send the original certificate/approval.
- 1.4.3 The contact person of this section is the person the approval will be sent to.

Chapter 2: Applicant's Reference

Your Reference: Please provide an **individual** internal reference to this application which you will want to see on all communication with EASA.

Chapter 3: Identification of Activity

- 3.1 Please identify whether it is a STC application or request for administrative re-issuance of an approved STC.

Please identify the classification simple, standard, complex which is referring to the explanatory note of the Annex of the new Fees & Charges Regulation:

| | Simple | Standard | Complex |
|---|---|---|---|
| EASA Supplemental Type Certificate (STC) EASA major design changes EASA major repairs | STC, major design change, or repair, only involving current and well-proven justification methods, for which a complete set of data (description, compliance check-list and compliance documents) can be communicated at time of application, and for which the applicant has demonstrated experience , and which can be assessed by the project certification manager alone, or with a limited involvement of a single discipline specialist. | All other STC, major design changes or repairs. | Significant (*) STC or major design change. |
| Validated US Federal Aviation Administration (FAA) STC | Basic (**) | Non-basic | Significant non-basic |
| Validated FAA major design change | Level 2 (**) major design changes when not automatically accepted. (***) | Level 1 (**) | Significant level 1 |
| Validated FAA major repair | N/A (automatic acceptance) | Repairs on critical component (**) | N/A |

(*) "Significant" is defined in paragraph 21A.101 (b) of the Annex to Regulation (EC) No 1702/2003 (and similarly in FAA 21.101 (b)).

(**) "Basic", "level 1", "level 2" and "critical component" are defined in the technical implementation procedures for airworthiness and environmental certification (TIP) to the EU/US draft bilateral aviation safety agreement.

(***) Automatic acceptance criteria by EASA for FAA level 2 major changes are defined in EASA Executive Director Decision 2004/04/CF, or in the technical implementation procedures for airworthiness and environmental certification (TIP) to the EU /US draft bilateral aviation safety agreement, as applicable.

Chapter 4: Product Identification

- 4.1 The weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the Type Certificate Data Sheet.
- 4.2 Identify the Type Certificate Number, the Type Certificate Holder, the Type and Model(s) to which this application is applicable. If applicable, please also identify



Application for Supplemental Type Certificate

variant(s).

- 4.3 Identify the applicable airworthiness code.

Chapter 5: Original Approval

- 5.1 Identify the original 3rd country approval number in case of a revision or validation of an existing approval.

Chapter 6: Description

- 6.1 Give a short title of the STC. Please restrict the title to 40 characters.
- 6.2 Give a brief description of the STC.
- 6.3 Identify all parts of the type design and the approved manuals affected by the STC and the certification specifications and environmental protection requirements with which the STC has been designed.
If necessary make reference to further attached documents in e.g. relating to Part 21, § 21A.114 compliance.
- 6.4 Identify any re-investigations necessary to show compliance of the changed / equipment with the applicable certification specification and environmental requirements; if necessary make reference to further attached documents.
- 6.5 Justify that the information provided is adequate either from own resources or through an arrangement with the TC-holder.

Chapter 7: Part 21 demonstration of eligibility

Please tick one of the four options and indicate the date of application and the EASA reference of the project/(A)DOA approval, as applicable.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 06 September 2012
REV. No. 2 22 November 2012

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 429

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: CAR527, Change 527-9
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-9

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|-------------------------------------|------|-----|---|
| Subpart B – Flight | | | | | |
| 527.27 | Centre of Gravity Limits | N/A | | | No change from Type Approval. |
| 527.29 | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | X | | |
| 527.51 | Takeoff | Flight Test | M.B. | | Flight tests to be performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter |
| 527.65 | Climb: All Engines Operating | Flight Test | M.B. | | |
| 527.67 | Climb: One Engine Inoperative | Flight Test | M.B. | | |
| 527.71 | Gliding Performance | Flight Test | M.B. | | |
| 527.75 | Landing | Flight Test | M.B. | | |
| 527.141 | Flight Characteristics – General | Flight Test | M.B. | | |
| 527.143 | Controllability and Maneuverability | Flight Test | M.B. | | |
| 527.171 | Stability – General | Flight Test | M.B. | | |
| 527.173 | Longitudinal Stability | Flight Test | M.B. | | |
| 527.175 | Demonstration of Longitudinal Stability | Flight Test | M.B. | | |
| 527.177 | Static Directional Stability | Flight Test | M.B. | | |
| 527.231 | Ground and Water Handling - General | Flight Test | M.B. | | |
| 527.241 | Ground Resonance | Flight Test | M.B. | | |
| 527.251 | Vibration | Flight Test | M.B. | | |
| Subpart C – Strength Requirements | | | | | |
| 527.301 | Loads – Air Drag Loads | Analysis | X | | |
| 527.301 | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | X | | |
| 527.303 | Factor of Safety | Analysis | X | | |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|---------------------------|---|-----------------------------------|------|-----|---|
| 527.305 | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.307 | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | Critical load factor in downward direction. |
| 527.547 | Main Rotor Structure | Flight Test | M.B. | | See comments for flight test above |
| 527.561 | Emergency Landing Conditions | | | | |
| 527.561(a) | General | N/A | | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |

Subpart D – Design and Construction

| | | | | | |
|-----------------|--|------------------------------------|--|----|---|
| 527.601 | Design | Drawings | | X | Design is conventional. |
| 527.603 | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 | Protection of Structure | Drawings | | X | |
| 527.611 | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 | Fitting Factor | Analysis | | X | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.727 | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not block doors. |
| 527.783 | Doors | N/A | | | |
| 527.787(a) | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 | External Load Attaching Means | N/A | | | Cargo basket is classified as a cargo compartment |
| 527.1387 | Position Light System Dihedral Angles | Statement | | ** | Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|--|------|--------------|--|
| 527.1401 | Anti-collision Light System | Statement | | ** <i>AB</i> | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 | Never Exceed Speed | Flight Test, Flight Manual Supplement | M.B. | | V _{NE} limits to be verified by flight test. |
| 527.1525 | Kinds of Operation | Flight Manual Supplement | M.B. | | |
| 527.1529 | Instructions for Continuing Airworthiness | ICA Provided | J.S. | | |
| 527.1557(a) | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | X <i>AB</i> | |
| 527.1557(b) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 | Rotorcraft Flight Manual – General | Flight Manual Supplement | M.B. | | |
| 527.1583(c) | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | M.B. | | |
| 527.1585 | Operating Procedures | Flight Manual Supplement | M.B. | | |
| 527.1587 | Performance Information | Flight Manual Supplement | M.B. | | |
| 527.1589 | Loading Information | Flight Manual Supplement & Placard | M.B. | | Placard installed on basket |

Note: M.B. indicates items being signed of by Michel Brulotte.

J.S. indicates items being signed of by Jack Staal.

** indicates items requiring extension of delegation.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 06 September 2012
REV. No. 2 22 November 2012

MAKE: Bell Helicopter
MODEL: 429

CORRESPONDANCE TO:
(If other than applicant)

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: CAR527, Change 527-9
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-9

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|----------------------------------|------|-----|---|
| Subpart B – Flight | | | | | |
| 527.27 <i>N/C</i> | Centre of Gravity Limits | N/A | | | No change from Type Approval. |
| 527.29 <i>N/C</i> | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | | X | |
| * 527.51 <i>→ More detailed conditions</i> | Takeoff | Flight Test | M.B. | | <i>175 → Speeds all changed.</i> |
| 527.65 <i>N/C</i> | Climb: All Engines Operating | Flight Test | M.B. | | |
| 527.67 <i>N/C</i> | Climb: One Engine Inoperative | Flight Test | M.B. | | |
| 527.71 <i>N/C</i> | Gliding Performance | Flight Test | M.B. | | |
| 527.75 <i>←</i> | Landing | Flight Test | M.B. | | |
| 527.141 <i>←</i> | Flight Characteristics – General | Flight Test | M.B. | | |
| 527.143 <i>←</i> | Controllability and Maneuverability | Flight Test | M.B. | | |
| 527.171 <i>←</i> | Stability – General | Flight Test | M.B. | | |
| 527.173 <i>←</i> | Longitudinal Stability | Flight Test | M.B. | | |
| 527.175 <i>*</i> | Demonstration of Longitudinal Stability | Flight Test | M.B. | | |
| 527.177 <i>←</i> | Static Directional Stability | Flight Test | M.B. | | Flight tests to be performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter |
| 527.231 <i>N/C</i> | Ground and Water Handling - General | Flight Test | M.B. | | |
| 527.241 <i>N/C</i> | Ground Resonance | Flight Test | M.B. | | |
| 527.251 <i>N/C</i> | Vibration | Flight Test | M.B. | | |

Subpart C – Strength Requirements

| | | | | | |
|--------------------|------------------------|-------------------------------------|--|---|--|
| 527.301 <i>N/C</i> | Loads – Air Drag Loads | Analysis | | X | |
| 527.301 <i>N/C</i> | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | | X | |
| 527.303 <i>N/C</i> | Factor of Safety | Analysis | | X | |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|---------------------------|---|-----------------------------------|------|-----|---|
| 527.305 <i>N/C</i> | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.307 <i>N/C 527-2</i> | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) <i>N/C</i> | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | Critical load factor in downward direction. |
| 527.547 <i>N/C</i> | Main Rotor Structure | Flight Test | M.B. | | See comments for flight test above |
| 527.561 <i>N/C 527-4</i> | Emergency Landing Conditions | | | | |
| 527.561(a) | General | N/A | | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) ✓ | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |

Subpart D – Design and Construction

| | | | | | |
|---------------------------|--|------------------------------------|--|----|---|
| 527.601 <i>N/C</i> | Design | Drawings | | X | Design is conventional. |
| 527.603 ✓ | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 ✓ | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 ✓ | Protection of Structure | Drawings | | X | |
| 527.611 ✓ | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 ✓ <i>527-2</i> | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 ✓ <i>527-4</i> | Fitting Factor | Analysis | | X | |
| 527.727 ✓ <i>527-2</i> | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.783 ✓ | Doors | N/A | | | Installation does not block doors. |
| 527.787(a) ✓ <i>527-2</i> | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) ✓ | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 ✓ <i>527-4</i> | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 ✓ <i>527-4</i> | External Load Attaching Means | N/A | | | Cargo basket is classified as a cargo compartment |
| 527.1387 ✓ | Position Light System Dihedral Angles | Statement | | ** | Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|--|------|-----|--|
| 527.1401 ✓ | Anti-collision Light System | Statement | | ** | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 ✓ 527-1 | Never Exceed Speed | Flight Test, Flight Manual Supplement | M.B. | | V _{NE} limits to be verified by flight test. |
| 527.1525 ✓ | Kinds of Operation | Flight Manual Supplement | M.B. | | Limited to VFR only. |
| 527.1529 ✓ | Instructions for Continuing Airworthiness | ICA Provided | M.B. | | |
| 527.1557(a) ✓ | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | X | Michel flew IFR |
| 527.1557(b) ✓ | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) ✓ | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) ✓ | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 ✓ 527-4 | Rotorcraft Flight Manual – General | Flight Manual Supplement | M.B. | | |
| 527.1583(c) ✓ | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | M.B. | | |
| 527.1585 ✓ | Operating Procedures | Flight Manual Supplement | M.B. | | |
| 527.1587 ✓ no effect | Performance Information | Flight Manual Supplement | M.B. | | |
| 527.1589 ✓ | Loading Information | Flight Manual Supplement & Placard | M.B. | | Placard installed on basket |

Airworthiness Manual Requirements

| | | | |
|--------------|----------------------------------|---|------|
| 5527.1584(e) | Rotorcraft Flight Manual – Units | SI and Imperial Units provided in Flight Manual Supplement | M.B. |
|--------------|----------------------------------|---|------|

No (e) change 527-4

Note: M.B. indicates items being signed of by Michel Brulotte.

J-S

Jack Staal



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Your file Votre référence

Our file Notre référence

C-12-0852
5010-0402

November 13, 2012

AERO Design Limited
2013 39 Ave. NE
Calgary, AB
T2E 6R7

ATTENTION: EDWARD BURGOIN – DAR290M

Dear Sirs:

**SUBJECT: Extension of DAR 290M Authority – Bell 429 Cargo Basket
 STC Number SH12-58 – Issue 1**

This letter is in response to your 02 November 2012, request for extension of delegation to cover the subject design change. You are hereby authorized to make findings of compliance for the following paragraphs as listed in Compliance Plan CP959, Revision 0:

| | |
|----------|---------------------------------------|
| 527.727 | Reserve Energy Absorption Drop Test |
| 527.1387 | Position Light System Dihedral Angles |
| 527.1401 | Anti-Collision Light System |

This is a one-time extension and is limited to be exercised for this approval only.

If you have any questions or wish to discuss this project further, please contact the project OPI, Jack Staal at the Edmonton TCC.

Yours truly,

F.J.B. Wright
Technical Team Lead, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-3856
Facs: 780-495-7963

AERO Design Ltd.
(403) 250-8027

2013 - 39th Avenue NE
Calgary, Alberta, T2E 6R7

PACKING SLIP
14 November 2012

Address:

Bell Helicopters

Attention:

Geoff Bliss

Phone #:

We hereby declare that the parts supplied herein do conform with the referenced drawings. Use and installation of the parts may require further approval, and shall also comply with applicable airworthiness standards.

Signature

Product: Bell 429 Cargo Basket Installation

Reference: Your Purchase Order #: _____

Documents Included with this Shipment:

Air Zermatt Package:

| | | |
|--|-----------|------------|
| Flight Manual Supplement | FMS959.90 | Revision 0 |
| Instructions for Continued Airworthiness | ICA959.91 | Revision 0 |
| Document Control List | DCL959-1 | Revision 0 |
| Document Control List | DCL959-2 | Revision 0 |
| Basket Installation Drawing | 95901 | Revision 0 |
| Mounting Provisions Installation Drawing | 95902 | Revision 0 |

Bell Package:

| | | |
|--|-----------|------------|
| Flight Manual Supplement | FMS959.90 | Revision 0 |
| Instructions for Continued Airworthiness | ICA959.91 | Revision 0 |
| Document Control List | DCL959-1 | Revision 0 |
| Document Control List | DCL959-2 | Revision 0 |
| Document Control List | DCL959-11 | Revision 0 |
| Document Control List | DCL959-12 | Revision 0 |
| Basket Installation Drawing | 95901 | Revision 0 |
| Mounting Provisions Installation Drawing | 95902 | Revision 0 |
| Basket Assembly Drawing | 95910 | Revision 0 |
| Basket Body Assembly Drawing | 95911 | Revision 0 |
| Lid Assembly Drawing | 95912 | Revision 0 |
| Front Sheet Drawing | 95915 | Revision 0 |
| Filler Sheet Drawing | 95916 | Revision 0 |
| Lid Checker Plate Drawing | 95917 | Revision 0 |
| Forward Fitting Drawing | 95920 | Revision 0 |
| Aft Fitting Drawing | 95921 | Revision 0 |
| Plates Drawing | 95922 | Revision 0 |
| Bushing Drawing | 95923 | Revision 0 |
| Forward Beam Drawing | 95930 | Revision 0 |
| Aft Beam Drawing | 95931 | Revision 0 |

AERO Design Ltd.
(403) 250-8027

2013 - 39th Avenue NE
Calgary, Alberta, T2E 6R7

PACKING SLIP
14 November 2012

Parts and Assemblies Included with this Shipment:

| Quantity Ordered | Quantity Shipped | Part Number | Description | ✓ |
|---------------------|---------------------|---------------|---|---|
| 1 | 0 | 95901-01-02 | Cargo Basket Installation, Left Hand, Bell 429 | |
| 1 | 0 | 95910-01-02 | Cargo Basket Assembly (Previously supplied) | |
| 1 | 1 | 95902-01-02 | Mounting Provisions Installation, Left Hand, Bell 429 | |
| 2 | 2 | 95920-01 | Forward Fitting | |
| 1 | 1 | 95921-01 | Aft Right Hand Fitting | |
| 1 | 1 | 95921-02 | Aft Left Hand Fitting | |
| 1 | 1 | 95930-01-02 | Forward Left Hand Beam | |
| 1 | 1 | 95931-01-00 | Aft Beam | |
| 4 | 4 | 95922-01 | Plate | |
| 4 | 4 | 95922-02 | Plate | |
| 4 | 4 | 95923-01 | Bushing | |
| 2 | 2 | 95923-02 | Bushing | |
| 8 | 8 | NAS6603-10 | Bolt | |
| 0 | 8 | NAS6603-8 | Bolt (Alternate) | |
| 8 | 8 | AN3-15A | Bolt | |
| 4 | 4 | AN3-4A | Bolt | |
| 16 | 16 | NAS1149F0332P | Washer | |
| 24 | 34 | NAS1149F0363P | Washer | |
| 20 | 20 | MS21044N3 | Nut | |
| 6 | 6 | AN4-16A | Bolt | |
| 12 | 12 | NAS1149F0463P | Washer | |
| 6 | 6 | MS21044N4 | Nut | |



Export Classification Certification

For Supplier:

Supplier ID:

| Name of Product | Bell PN | Supplier PN | Was this Part Originally Designed for a Military Application | Has this Part been Modified for a Military Application | Is this Part Export Controlled by the Government of Your Country? Y/N | Part contains US origin data? | Does this part have an explosive? Y/N | ITAR or EAR/ECCN Classification Number | Country of Origin | Harmonized Tariff Schedules (Schedule A) | |
|--|---------|-------------|--|--|---|-------------------------------|---------------------------------------|--|-------------------|--|--|
| Bell 429 Quick Release Cargo Basket Installation | | 95901-01-02 | N | N | N | N | N | | CANADA | | AERO Design Ltd. Calgary, Alberta, Canada |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Supplier Address: 2013 39th Avenue NE, Calgary, Alberta, Canada, T2E 6R7

Registered with the Office of Defense Trade Controls:

Authorized Signature:

Title: Engineering Technologist

Print Name: Jeff Clarke

Phone Number: 403-250-8027

Date: 14 November 2012

E-Mail: jeff@aerodesign.ca

Audit Note:

I hereby certify that the information on this document is true and accurate. I understand that I am liable for any false statements or material omissions made on or in connection with this document. I shall immediately notify Bell Helicopter of any change in the above described export status or change in manufacturer.

Instructions: All suppliers fill out columns 1, 2, 5, 8, 9 and 10. U.S. suppliers will also fill out columns 6 and 7. Non - U.S. suppliers will also fill out columns 3 and 4. If column 4 is marked in the affirmative, Non - U.S. suppliers must also fill out columns 6 and 7.

DÉCLARATION DE CONFORMITÉ STATEMENT OF CONFORMITY

Annexe « A », configuration de base
Annex "A", Basic configuration

Rév. / Rev.: « - »

Modèle d'aéronef : 429
Aircraft Model:
Numéro de série : 57063
Serial Number:

Bordereau de vente
Sales Order C1057063 rev "T" 11/13/2012

Date : NOV 16, 2012

Objet :
Subject : Conformity Request For The Aero Design Ltd. Left Hand Cargo Basket Provisions And Equipment Installation On M429 S/N 57063.

Références : Aero Design Ltd. Drawing 95902 Rev. 0 – Bell 429 Quick Release Cargo Basket Mounting Provisions.
References: Aero Design Ltd. Drawing 95901 Rev. 0 – Bell 429 Quick Release cargo Basket Installation.

PAR LA PRÉSENTE, JE CERTIFIE QUE LES INSTALLATIONS ET LES SYSTÈMES DE CET AÉRONEF SONT CONFORMES AUX DESSINS ET AUX DÉVIATIONS CONSIGNÉS CI-APRÈS.

I HEREBY CERTIFY THAT AIRCRAFT INSTALLATIONS AND SYSTEMS CONFORM TO BELOW MENTIONED DRAWINGS AND LISTED DEVIATIONS.

| N° de pièce Part Number | Nomenclature | Rév. F/D Rev. | Rév. P/L Rev. | EO, LDV/EO d'essai non inc. Uninc. EO's, LDV's/TEST EO's | Déviations Deviations |
|----------------------------|--------------|---------------------|---------------------|---|--------------------------|
| N/R | N/R | N/R | N/R | N/R | N/R |

NOTE: FOR THE ITEMS INSTALL IN THE AIRCRAFT BEFORE CERTIFICATION, SEE A COPY OF THE AIRCRAFT BUILD DEFINITION ATTACHE WITH ANNEX "A & E"




Inspecteur(s) autorisé(s) / Authorized Inspector(s)

Conserver le formulaire a titre permanent avec la documentation du plan d'essai
Retain the form permanently with the test plan documentation.

**DÉCLARATION DE CONFORMITÉ
STATEMENT OF CONFORMITY**

ANNEXE « E », MODIFICATIONS
Annex "E", Mods

Rév. / Rev.: « - »

Modèle d'aéronef : 429
Aircraft Model:

Numéro de série : 57063
Serial Number:

Date : NOV 16, 2012

Objet :

Subject : Conformity Request For The Aero Design Ltd. Left Hand Cargo Basket Provisions And Equipment Installation On M429 S/N 57063.

Références :

References: Aero Design Ltd. Drawing 95902 Rev. 0 – Bell 429 Quick Release Cargo Basket Mounting Provisions.
Aero Design Ltd. Drawing 95901 Rev. 0 – Bell 429 Quick Release cargo Basket Installation.

Bordereau de vente Sales
Order

C1057063 rev "T" 11/13/2012

LISTE DES MODIFICATIONS SUR L'AÉRONEF DE BASE.

LIST OF MODIFICATIONS TO THE BASIC AIRCRAFT.

The Following Installations Are In Accordance With Current Drawing Requirements, Per The Applicable BOM's:

95902-01-02 LH Mounting Provisions Installation.
95901-01-02 LH Cargo Basket Installation.



INSPECTEUR(S) AUTORISÉ(S) / AUTHORIZED INSPECTOR(S)

CONSERVER LE FORMULAIRE A TITRE PERMANENT AVEC LA DOCUMENTATION DU PLAN D'ESSAI
RETAIN THE FORM PERMANENTLY WITH THE TEST PLAN DOCUMENTATION.

BELL HELICOPTER TEXTRON CANADA LIMITEE/
BELL HELICOPTER TEXTRON CANADA LIMITED
12,800 rue de l'Avenir,
Mirabel, Quebec J7J 1R4

AIRCRAFT BUILD DEFINITION CERTIFICATION

AIRCRAFT MODEL : M429
AIRCRAFT BUILD DEFINITION DATED : 11-07-22

AIRCRAFT SERIAL NUMBER : 057063
REVISION : 00

MANUFACTURING ENGINEERING

I HEREBY CERTIFY THAT THIS AIRCRAFT BUILD DEFINITION DEFINES THE CONFIGURATION OF ABOVE-MENTIONED AIRCRAFT IN ACCORDANCE WITH REQUIREMENTS OF MEDI 6313-001-004 AND QAI 9.14.

SIGNATURE Martine Lévesque

DATE 11-07-22

ENGINEERING AIRWORTHINESS

ADDENDUM: ☒ YES ☐ NO

☒ I HEREBY CERTIFY THAT ALL DRAWINGS RELATING TO THE ABOVE-MENTIONED AIRCRAFT HAVE BEEN APPROVED BY TC OR BY A D.E. ON BEHALF OF TC.

☐ I HEREBY CERTIFY THAT ALL DRAWINGS RELATING TO THE ABOVE-MENTIONED AIRCRAFT HAVE BEEN APPROVED BY FAA OR BY A DER ON BEHALF OF FAA.

EXCEPTIONS CLASSIFIED AS MINOR CAN BE FOUND ON THE ADDENDUM FOR FAA TYPE DESIGNED AIRCRAFT.

SIGNATURE Melanie Bélanger

DATE July 22, 2011

QUALITY ASSURANCE

I HEREBY CERTIFY THAT ALL REQUIREMENTS PER DRAWING 429-100-001 HAVE BEEN INCORPORATED ON THE ABOVE-MENTIONED AIRCRAFT.

SIGNATURE Joseph Lavoie

DATE September 26, 2011

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>DESCRIPTION</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>E.O. EFFECTIVITY</u> | <u>DOT/FAA APPR.</u> |
|---------------------------|----------------------|--|---|-----------------------------|-------------------------------|
| 407-770-004 | G E | GENERIC FLT CONTROL COMPUTER; MAIN PROCESSOR LOGIC SOFTWARE | | | FD B9781 PL B9781 |
| 407-770-005 | C C | GENERIC FLIGHT CONTROL COMPUTE R: IO PROCESSOR LOGIC SOFTWARE | | | FD B9781 PL B9781 |
| 429-001-001 | H U | M/R CNTL INSTL - COCKPIT | | | FD C1860 PL |
| 429-001-005 | E R | CONTROLS AND HYDRAULICS INSTL - CYCLIC/COLLECTIVE, ROOF | | | FD PL ADMIN |
| 429-001-007 | J N | CONTROLS INSTL, T/R - FORWARD | | | FD PL |
| 429-001-009 | F K | CONTROLS INSTL, T/R - AFT | | | FD C1719 PL C1719 |
| 429-005-005 | D E | AIRCRAFT DATA INTERFACE UNIT, 429 | 429AA6636A | 057003-SUB | FD C1555 PL C1555 B9781 |
| 429-005-026 | E F | FLIGHT CONTROL COMPUTER ASSY, 429 | | | FD PL |
| 429-010-200 | F H | PYLON INSTALLATION | | | FD PL |
| 429-010-400 | J R | SWASHPLATE & SUPPORT ASSY-ROTA TING CONTROLS | | | FD C1936 PL C1936 |
| 429-012-100 | D F | TAIL ROTOR INSTALLATION | | | FD PL |

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>DESCRIPTION</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>E.O. EFFECTIVITY</u> | <u>DOT/FAA APPR.</u> |
|---------------------------|----------------------|-----------------------------|---|-----------------------------|--------------------------|
| 429-012-200 | J N | CONTROLS INSTL - TAIL ROTOR | | | FD PL |
| 429-016-101 | K L | BLADE ASSEMBLY - TAIL ROTOR | | | FD C1870 PL C1870 |
| 429-020-001 | N P | MARKING INSTALLATION | | | FD PL |
| 429-020-002 | H R | MINIMUM INTERIOR | | | FD C1937 PL C1937 |
| 429-030-830 | J M | DOOR INSTL, CREW | | | FD C1700 PL C1700 |
| 429-030-840 | E E | DOOR INSTL - PAX | | | FD C1736 PL C1736 |
| 429-030-850 | H K | DOOR INSTL - SLIDING | | | FD C1736 PL C1845 |
| 429-030-860 | C C | DOOR INSTL - BAGGAGE | | | FD C2264 PL C2264 |
| 429-061-011 | D E | COWLING INSTALLATION | | | FD B9781 PL C1739 |
| 429-065-012 | D F | OIL SYSTEM INSTALLATION | | | FD B9781 PL |
| 429-066-400 | L V | FUEL TANK INSTALL | | | FD C1822 PL C1822 |
| 429-066-500 | K R | FUEL SYSTEM & BOOT INSTL | | | FD C1964 PL |

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>DESCRIPTION</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>E.O. EFFECTIVITY</u> | <u>DOT/FAA APPR.</u> |
|---------------------------|----------------------|---|---|-----------------------------|--------------------------|
| 429-100-001 | - GV | GENERAL ARRANGEMENT - HELICOPT ER ASSEMBLY & KITS | | | FD B9781 PL |
| 429-100-005 | R AC | FUSELAGE ASSY | | | FD C2366 PL C2366 |
| 429-100-700 | A C | TAILBOOM INSTALLATION | | | FD B9781 PL C2196 |
| 429-110-100 | J AD | HUB & BLADE INSTL - MAIN ROTOR | | | FD C1682 PL |
| 429-110-400 | C E | ROTOR CONTROLS INSTALLATION | | | FD C0822 PL C0822 |
| 429-140-001 | J K | DRIVE SYSTEM INSTALLATION | | | FD PL |
| 429-160-001 | E P | POWERPLANT INSTL | | | FD PL |
| 429-180-001 | B B | CONTROL HYDRAULICS INSTL - ROO F, DIRECTIONAL | | | FD PL |
| 429-401-001 | E | RIGGING AND TOOL APPLICATIONS, FLIGHT CONTROLS FOR MODEL 429 | | | FD C2254 |
| 429-460-001 | B | N1 RIGGING SPEC | | | FD C2380 |
| 429-705-003 | - A | ACCESSORY KIT-HVAC PROVISIONS | | | FD B9781 PL C2535 |
| 429-705-010 | - D | ELECTRICAL PROVISIONS | | | FD B9781 PL |

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>DESCRIPTION</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>E.O. EFFECTIVITY</u> | <u>DOT/FAA APPR.</u> |
|---------------------------|----------------------|--|---|-----------------------------|--------------------------|
| 429-706-015 | C D | ELT KIT INSTL, C406-N HM | | | FD PL |
| 429-706-020 | B D | KIT, 200 AMP STARTER - GENERAT OR | | | FD B9781 PL C0346 |
| 429-706-025 | E J | AUXILIARY EQUIPMENT KITS - BAT TERIES | | | FD C2353 PL C2353 |
| 429-706-027 | B B | ARTICULATED LANDING LIGHT KIT | | | FD B9999 PL B9999 |
| 429-706-042 | B D | RADAR ALTIMETER KIT INSTALLATI ON, KRA 405B | | | FD PL |
| 429-706-046 | C C | ICS KEYING - KIT, INSTALLATION | | | FD C0198 PL C0198 |
| 429-706-052 | C C | PROVISIONS - SKID GEAR | | | FD B9781 PL C0346 |
| 429-706-061 | B E | AUXILIARY EQUIPMENT KIT-IBF PR OV | | | FD PL |
| 429-706-062 | A C | AUXILIARY EQUIPMENT KIT - SKID GEAR, STD | | | FD B9781 PL B9781 |
| 429-706-065 | A B | AC DRIVE KIT - TRANSMISSION AN D MAST ASSY | | | FD PL |
| 429-706-300 | - B | KIT-INLET BARRIER FILTER, INST L | | | FD B9781 PL C0346 |
| 429-706-701 | J L | DUAL CONTROLS KIT | | | FD PL |

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>DESCRIPTION</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>E.O. EFFECTIVITY</u> | <u>DOT/FAA APPR.</u> |
|---------------------------|----------------------|--|---|-----------------------------|--------------------------|
| 429-706-702 | D L | AUXILIAIRY EQUIPMENT KIT-ROTOR BRAKE | | | FD PL |
| 429-709-001 | - A | HEATER ELECTRICAL HARDWARE | | | FD B9781 PL C1132 |
| 429-709-002 | - A | ELECTRICAL PROV AND COMPONENTS - AIR CONDITIONING | | | FD C0335 PL C2370 |

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>DESCRIPTION</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>E.O. EFFECTIVITY</u> | <u>DOT/FAA APPR.</u> |
|---------------------------|----------------------|---------------------------------------|---|-----------------------------|--------------------------|
| 429-799-001 | E E | CUSTOMIZING - FIRE EXTINGUISHER INSTL | | | FD ADMIN PL ADMIN |
| 429-799-016 | A A | CUST - PASS DOOR SEAL INSTL | | | FD ADMIN PL ADMIN |
| 429-899-950 | - AU | CUSTOMIZING - MODEL 429 | | | FD B9903 PL C2210 |

INCLUDING

| | |
|-----------------|----------------------|
| 429-799-001-103 | FIRE EXTINGUISHER |
| 429-799-016-101 | PASS DOOR SEAL INSTL |

DATE : 11-07-22

AIRCRAFT BUILD DEFINITION

MODEL : M429

REGISTRATION : N/A

SERIAL NO. : 057063

REVISION : 00

| <u>DRAWING NUMBER</u> | <u>REV FD PL</u> | <u>UNINC. E.O.'S EMBODIED IN A/C 057063</u> | <u>KIT</u> | <u>DESCRIPTION</u> | <u>DOT/FAA APPR. #</u> |
|---------------------------|----------------------|---|------------|---|----------------------------|
| 429H-224-1 | | | | BLEED AIR HEAT PROV. SR00692DE PER SH10-34 | |
| 965-42901-012 | | | | W/STRIKE UPR PROV SR02791NY PER SH10-4 | |
| 965-42901-013 | | | | W/STRIKE LOW PROV SR02791NY PER SH10-4 | |

| MODEL: 429 REGISTRATION: 57063 REV. 0 | | | AIRCRAFT BUILD DEFINITION ADDENDUM | | | |
|--|-----|----|---|-------------------------------|-------------------|------------------|
| DWG. NO. | REV | | DESCRIPTION | UNINC EO'S EMBODIED IN A/C | EO EFFECTIVITY | DOT/FAA APPR. |
| | FD | PL | | | | |
| 429-001-001 | | R | M/R CNTL INSTL - COCKPIT | | | C1860 |
| 429-001-005 | D | M | CONTROLS AND HYDRAULICS INSTL - CYCLIC/COLLECTIVE, ROOF | | | C1719 |
| 429-001-007 | H | M | CONTROLS INSTL - T/R - FORWARD | | | B9846 |
| 429-005-026 | D | E | FLIGHT CONTROL COMPUTER ASSY, 429 | | | C0967 |
| 429-010-200 | E | G | PYLON INSTALLATION | | | B9781 |
| 429-012-100 | C | E | TAIL ROTOR INSTALLATION | | | C1681 |
| 429-012-200 | H | M | CONTROLS INSTL - TAIL ROTOR | | | C1936 |
| 429-020-001 | M | N | MARKING INSTALLATION | | | C2240 |
| 429-065-012 | | E | OIL SYSTEM INSTALLATION | | | B9781 |
| 429-066-500 | | P | FUEL SYSTEM & BOOT INSTL | | | C1443 |
| 429-100-001 | | GU | GENERAL ARRANGEMENT - HELICOPTER ASSEMBLY & KITS | | | C2535 |
| 429-110-100 | | AC | HUB & BLADE INSTL - MAIN ROTOR | | | C1682 |
| 429-140-001 | H | J | DRIVE SYSTEM INSTALLATION | | | C0511 |
| 429-160-001 | D | N | POWEPLANT INSTL | | | C1857 |
| 429-180-001 | A | A | CONTROL HYDRAULICS INSTL - ROOF, DIRECTIONAL | | | B9781 |
| 429-705-010 | | C | ELECTRICAL PROVISIONS | | | B9781 |
| 429-706-015 | B | C | ELT KIT INSTL, C406-N HM | | | B9781 |
| 429-706-042 | A | | RADAR ALTIMETER KIT INSTALLATION, KRA 405B | | | B9781 |
| | | C | | | | C0346 |
| 429-706-061 | A | | AUXILIARY EQUIPMENT KIT - IBF PROV | | | B9781 |
| | | D | | | | C0353 |
| 429-706-065 | - | | AC DRIVE KIT - TRANSMISSION AND MAST ASSY | | | B9781 |
| | | A | | | | C0346 |
| 429-706-701 | H | K | DUAL CONTROL KIT | | | C1138 |
| 429-706-702 | C | | AUXILIARY EQUIPMENT KIT-ROTOR BRAKE | | | B9890 |
| | | K | | | | C0346 |
| 429-799-002 | D | D | CUSTOMIZING - FIRE EXTINGUISHER INSTL | | | C1767 |
| 429-799-016 | - | - | CUST - PASS DOOR SEAL INSTL | | | C0827 |
| | | | | | 22-Jul-11 | |
| For FAA Type Design aircraft only: These exceptions are the following EO's / LDV's which have been released by BHTC / BHTI and are classified as minor, and are presently in the process of being approved through BHT, Fort Worth FAA Approval system. | | | | | | |
| DRAWING NUMBER | | | EO / LDV NUMBER | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

AERO Design Ltd.
(403) 250-8027

2013 - 39th Avenue NE
Calgary, Alberta, T2E 6R7

PACKING SLIP
15 November 2012

Address:

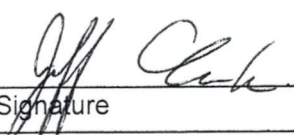
Bell Helicopters

Attention:

Geoff Bliss

Phone #:

We hereby declare that the parts supplied herein do conform with the referenced drawings. Use and installation of the parts may require further approval, and shall also comply with applicable airworthiness standards.


Signature

Product: Bell 429 Cargo Basket Installation

Reference: Your Purchase Order #: _____

Parts and Assemblies Included with this Shipment:

| Quantity Ordered | Quantity Shipped | Part Number | Description |
|------------------|------------------|-------------|-----------------|
| 1 | 1 | 95927-01 | Placard |
| 5 | 5 | CR3213-4-02 | CherryMax Rivet |

✓



Intra-Canada Air Waybill Lettre de transport aérien intérieure

Not all services and options available to all destinations.
Certains services et options ne sont pas disponibles pour toutes les destinations.

Sender's Copy
Copie expéditeur

Freight / Fret: _____ G.S.T./H.S.T. / TPS./T.V.H.: _____ P.S.T./Q.S.T. / T.V.P./T.V.Q.: _____ Other / Autre: _____ Total: _____

1 From Please print and press firmly. / Expéditeur Écrivez en caractères d'imprimerie. Appuyez fermement SVP.

Date: 4/15/12 Sender's FedEx Account Number / N° de compte FedEx de l'expéditeur: _____

Sender's Name / Nom de l'expéditeur: JEFF CLARKE Phone / Téléphone: (403) 250 8027

Company / Nom de la société: AERO DESIGN LTD.

Address / Adresse: 2013 39th AVE NE

Address / Adresse: _____ Dept./Floor/Service/Étage: _____

City / Ville: CALGARY Province: AB Postal Code / Code postal: T2E 6R7

2 Your Internal Reference

Votre référence interne
First 24 characters will appear on invoice.
Les 24 premiers caractères apparaîtront sur la facture.

OPTIONAL/FACULTATIF

3 To/Destinataire

☐ Residential Delivery / Livraison résidentielle
Recipient's Name / Nom du destinataire: GEORGE BLISS Phone / Téléphone: (505) 971 6500

Company / Nom de la société: BEU HELI COPTERS

Address / Adresse: 12,800 RUE DE L'AVENIR

Address / Adresse: _____

City / Ville: MIRABEL Province: QC Postal Code / Code postal: J7J 1K4

4 Shipment Information/Informations sur l'envoi

Total Packages / Nombre total de colis: 1 Total Weight / Poids total: 1 ☒ lbs. ☐ kg. DIM / Poids VOL: Long / Larg / Haut ☐ in. ☐ cm.

5a Express Package Service/Service colis express

☒ FedEx Priority Overnight ☒ FedEx First Overnight ☐ FedEx 2Day ☐ FedEx Economy (FedEx Box and FedEx Tube not accepted, Boîte FedEx et Tube FedEx non acceptés).

5b Express Freight Service/Service fret express

☐ FedEx 1Day Freight Booking Number/Numéro de réservation: _____ REQUIRED/REQUIS
Call 1.866.744.7493 to book shipment/Composez le 1.866.744.7493 pour réserver de l'espace pour votre envoi.

6 Packaging/Emballage

☒ FedEx Envelope* / Enveloppe FedEx* ☐ FedEx Pak* / Pak FedEx* ☐ FedEx Box / Boîte FedEx ☐ FedEx Tube / Tube FedEx ☐ Other / Autre: _____



Ship and track packages at fedex.ca
Faites vos envois et leur suivi à fedex.ca

Questions? Visit fedex.ca

or call 1.800.GoFedEx 1.800.463.3339.

Des questions? Visitez fedex.ca

ou composez le 1.800.GoFedEx 1.800.463.3339.

7 Special Handling/Manutention spéciale

HOLD at FedEx Location

☐ RETENIR à la succursale FedEx
May not be in the same city. Not available for FedEx First Overnight/Pour être situé dans une autre ville. Pas disponible pour FedEx First Overnight.

☐ SATURDAY Delivery / Livraison le SAMEDI

Available to select locations. Not available for FedEx First Overnight, FedEx Economy, or FedEx 1Day Freight/Disponible à certains endroits. Pas disponible pour FedEx First Overnight, FedEx Economy, ou FedEx 1Day Freight.

Does this shipment contain dangerous goods? / Cet envoi contient-il des marchandises dangereuses?*

☒ No / Non ☐ Yes / Oui As per attached Shipper's Declaration/Seelon la déclaration de l'expéditeur, ci-jointe.

☐ Yes / Oui Shipper's Declaration not required/Déclaration de l'expéditeur non requise.

☐ Dry Ice / Dioxyde de carbone, solide 9, UN 1845 x _____ kg

☐ DESCRIPTION

*Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box/On ne peut pas expédier des marchandises dangereuses (y compris la glace sèche) dans un emballage FedEx, ni les déposer dans une boîte à colis FedEx Express.

☐ Cargo Aircraft Only / Avion cargo uniquement

8 Payment Bill transportation charges to./ Paiement Facturer le transport à :

Enter FedEx Acct. No. or Credit Card No. below.
Indiquer ci-dessous le n° de compte FedEx ou de la carte de crédit.

☐ Sender / Expéditeur Acct. No. in Section 1 will be billed. Les frais seront imputés au numéro de compte figurant à la rubrique 1.

☒ Recipient / Destinataire

☐ Third Party / Tierce partie

☐ Credit Card / Carte de crédit

☐ Cash/Cheque / Argent liquide/Chèque

FedEx Acct. No. / N° de compte FedEx

Credit Card No. / N° de carte de crédit

Credit Card Exp. Date / Date d'expiration de la carte de crédit

Credit Card Auth. / Autorisation de carte de crédit

9 Sign to Authorize Delivery Without a Signature/Signer pour autoriser la livraison sans signature

Sender authorizes FedEx to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless FedEx from any claims resulting therefrom/L'expéditeur autorise FedEx à livrer le présent colis sans avoir obtenu de signature attestant de la livraison et libère FedEx de toute réclamation pouvant en résulter.

Sender's Signature / Signature de l'expéditeur

OPTIONAL/FACULTATIF

10 Required Signature/Signature requise

Sender's signature and liability limitation / Signature de l'expéditeur et limite de responsabilité
Use of this Air Waybill constitutes your agreement to all the terms and conditions on the back of this Air Waybill and in the current FedEx Service Guide, which may limit our liability for damage, loss, delay, shortage, misdelivery, misinformation, or failure to provide information in connection with your shipment. Features of service may vary from location to location. See the current FedEx Service Guide or call 1.800.GoFedEx 1.800.463.3339 for further information.
En utilisant cette lettre de transport aérien, vous acceptez les clauses et conditions qui figurent au verso de celle-ci ainsi que dans le Guide des services de FedEx actuel, clauses qui peuvent limiter notre responsabilité à l'égard des dommages, pertes, retards, livraisons incomplètes, livraisons erronées, informations fautives ou incapacité de fournir de l'information sur votre envoi. Les modalités de service peuvent varier d'un endroit à l'autre. Voir le Guide des services de FedEx actuel ou téléphoner au 1.800.GoFedEx 1.800.463.3339 pour plus d'information.

Sender's Signature / Signature de l'expéditeur

Signature de l'expéditeur

PART 157239
Rev. Date 12/10
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631

FedEx Tracking Number / Numéro de suivi de FedEx

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0450

RETAIN THIS COPY FOR YOUR RECORDS. / CONSERVEZ CET EXEMPLAIRE POUR VOS DOSSIERS.

05/12

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Définitions On this Air Waybill, "we," "our," "us," "FedEx" and "FedEx" refer to Federal Express Canada Ltd., its principals, subsidiaries, branches and affiliates, and their respective employees, agents and independent contractors. "You" and "your" include the shipper/sender, recipient/consignee and their respective employees, principals, agents and independent contractors.

"Package" means any container or envelope that is accepted by us for delivery, including any items tendered by you utilizing our automated systems, meters, manifests or air waybills. "Shipment" means one or more packages, or any part thereof, moving on one Air Waybill. The Residential Delivery charge will apply to shipments to a home or a business operating out of a home, where the entrance to the residence is not open to the public. Please refer to the Terms and Conditions section of the FedEx Service Guide at fedex.ca for more details.

Agreement To Terms By giving us your shipment, you agree, regardless of whether you sign the front of this Air Waybill, for yourself and as agent for and on behalf of any other person or entity having an interest in this shipment, to all terms and conditions on this NON-NEGOTIABLE Air Waybill, in any applicable tariff, and in the current FedEx Service Guide (the current FedEx Service Guide can be unilaterally modified, amended, or supplemented by us without notice), copies of which are available upon request at any one of our local offices or by calling 1.800.GoFedEx, 1.800.463.3338. If there is a conflict between this Air Waybill and either any applicable tariff or the current FedEx Service Guide, then in effect, the applicable tariff will control (the current FedEx Service Guide has secondary priority). The English language version shall be the controlling version of this Air Waybill. NO ONE IS AUTHORIZED TO ALTER OR MODIFY THE TERMS AND CONDITIONS OF THIS AGREEMENT. This Air Waybill shall be binding on us when the shipment is accepted; we may mark this Air Waybill with an employee number as our signature.

Your Obligations You warrant that each article in the shipment is properly described on this Air Waybill and is acceptable for transport by us, and that the shipment is properly marked, addressed and packed to ensure safe transportation with ordinary care in handling. You, the shipper, will always be primarily responsible for all charges, including transportation charges, and all duties, assessments, governmental penalties and fines, taxes and our legal fees and costs, related to this shipment. Further and without limiting the generality of the foregoing, you shall indemnify us and hold us harmless against all liabilities, losses, claims, damages, costs and expenses of any nature whatsoever, incurred as a consequence of your non-observance of any applicable laws, government regulations, orders or requirements.

NOTICE CONCERNING LIMITATIONS OF LIABILITY

Read Transport Notice Any carriage of your shipment by road may be subject to Federal and Provincial laws, regulations, orders or requirements which may govern and serve to limit our liability in respect of damage to, or loss, delay, shortage, misdelivery, nondelivery, misinformation or failure to provide information in connection with your shipment.

Limitation of Liability IF NOT GOVERNED BY FEDERAL OR PROVINCIAL LAWS, REGULATIONS, ORDERS OR REQUIREMENTS AS DESCRIBED ABOVE, OUR MAXIMUM LIABILITY FOR DAMAGE, LOSS, DELAY, MISDELIVERY, NONDELIVERY, MISINFORMATION, FAILURE TO PROVIDE INFORMATION OR MISDELIVERY OF INFORMATION RELATING TO YOUR SHIPMENT, EVEN IF CAUSED BY OUR NEGLIGENCE OR GROSS NEGLIGENCE, IS LIMITED BY THIS AIR WAYBILL TO \$100 PER SHIPMENT, UNLESS YOU DECLARE A HIGHER VALUE FOR CARRIAGE AS DESCRIBED BELOW (SUBJECT TO THE MAXIMUM AMOUNTS SPECIFIED IN THE FEDEX SERVICE GUIDE). WE DO NOT PROVIDE INSURANCE COVERAGE OF ANY KIND, BUT YOU MAY PAY AN ADDITIONAL CHARGE FOR EACH ADDITIONAL \$100 OF DECLARED VALUE OR FRACTION THEREOF. IF YOU DECLARE A HIGHER VALUE FOR CARRIAGE AND PAY AN ADDITIONAL CHARGE, OUR MAXIMUM LIABILITY WILL BE THE LESSER OF YOUR DECLARED VALUE FOR CARRIAGE (SUBJECT TO THE MAXIMUM AMOUNTS SPECIFIED IN THE FEDEX SERVICE GUIDE), THE SHIPMENT'S REPAIR COSTS, ITS DEPRECIATED VALUE, OR ITS REPLACEMENT COSTS.

Declared Value Limits Shipments containing items of extraordinary value are limited to a maximum declared value for carriage of \$1,000. The maximum declared value we allow for carriage per air waybill for each FedEx Envelope or FedEx Pak shipment is \$100. Please check the current FedEx Service Guide and any applicable tariff for further explanation of the declared value limits. If you send more than one package on this Air Waybill, the declared value for carriage of each package will be determined by dividing the total declared value for carriage by the number of packages in the shipment.

Liabilities Not Assumed IN ANY EVENT, WE WON'T BE LIABLE FOR ANY DAMAGES, WHETHER DIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL, IN EXCESS OF THE DECLARED VALUE FOR CARRIAGE INCLUDING BUT NOT LIMITED TO LOSS OF INCOME OR PROFITS), WHETHER OR NOT WE KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES MIGHT BE INCURRED. We won't be liable for your acts or omissions, including but not limited to incorrect declaration of the shipment, improper or insufficient packing, securing, marking, or addressing of the shipment, or for the acts or omissions of the recipient or anyone else with an interest in the shipment. We won't be liable for damage, loss, delay, misdelivery, nondelivery, misinformation, failure to provide information or misdelivery of information relating to shipments of cash, currency or other prohibited items. We won't be liable for loss, damage, delay, misdelivery, nondelivery, misinformation, failure to provide information or misdelivery of information relating to your shipment caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions, acts of public enemies, war, strikes, civil commotions or acts or omissions of public authorities (including customs and health officials) with actual or apparent authority. YOU SHOULD CONTACT AN INSURANCE AGENT OR BROKER IF INSURANCE COVERAGE IS DESIRED. WE DO NOT PROVIDE INSURANCE COVERAGE OF ANY KIND.

No Warranties We make no warranties, express or implied.

Claims ALL CLAIMS MUST BE MADE IN WRITING AND WITHIN STRICT TIME LIMITS, subject to any applicable laws, government regulations, orders or requirements. SEE THE CURRENT FEDEX SERVICE GUIDE AND ANY APPLICABLE TARIFF FOR DETAILS. Any right to claim damages against us shall be extinguished unless an action is brought within two years from the date of delivery of the shipment or the date on which the shipment should have been delivered. We are not obligated to act on any claim until all transportation charges have been paid; the claim amount may not be deducted from these charges. If the recipient accepts the shipment without noting any damage on the delivery record, we will assume the shipment was delivered in good condition. In order for us to consider a claim for damage, you must make the contents, original shipping cartons and packing available to us for inspection at the delivery location, and you must retain all such material until the claim is concluded.

Right To Inspect Your shipment may, at our option or at the request of governmental authorities, be opened and inspected by us or such authorities at any time.

Responsibility For Payment Even if you give us different payment instructions, you, the shipper, will always be primarily responsible for all charges, including transportation charges, and all duties, governmental penalties and fines, taxes, and our legal fees and costs, related to this shipment. You will also be responsible for any costs we may incur in returning your shipment to you or warehousing it pending disposition.

Letter of Instruction If you do not complete all the documents required for carriage of your shipment or if the documents you submit are not appropriate for the services or destination requested, you hereby instruct us, where permitted by law, to complete, correct or replace the documents for you at your expense. However, we are not obligated to do so. If a substitute form of air waybill is needed to complete delivery of your shipment and we complete that document, the terms and conditions of this Air Waybill will continue to govern. We are not liable to you or any other person for our actions on your behalf under this provision.

Items Not Acceptable For Transportation We won't accept certain items for carriage, and other items may be accepted for carriage only to limited destinations or under restricted conditions. We reserve the right to reject packages based upon these limitations or for reasons of safety or security. You may consult the current FedEx Service Guide and any applicable tariff for details.

Mandatory Law Insofar as any provisions contained or referred to in this Air Waybill, the current FedEx Service Guide, or any applicable tariff may be contrary to any applicable laws, government regulations, orders or requirements, such provisions shall remain in effect as a part of this Agreement to the extent that they are not overridden. The invalidity or unenforceability of any provisions shall not affect any other part of this Air Waybill, the current FedEx Service Guide or any applicable tariff.

Conditions du contrat

Définitions. Sur la présente Lettre de transport aérien « nous », « notre » et « notre » désignent Federal Express Canada Ltée, ses commettants, filiales, succursales et sociétés affiliées ainsi que leurs employés, agents et entrepreneurs indépendants respectifs. « Vous », « votre » et « vôtres » désignent l'expéditeur, le destinataire ou réceptionnaire, leurs employés, commettants, agents et entrepreneurs indépendants. « Colis » désigne tout conteneur ou enveloppe que nous acceptons pour la livraison, y compris tout article que vous nous présentez et qui utilise nos systèmes automatisés, appareils de mesure, manifests ou lettres de transport. « Envoi » désigne tous les colis qui nous sont présentés et que nous acceptons de faire figurer sur une même Lettre de transport aérien. Le supplément pour livraison résidentielle s'applique aux envois livrés à une résidence ou à une entreprise exploitée à partir d'une résidence lorsque l'entrée principale n'est pas accessible au public. Veuillez consulter les Modalités du Guide des services de FedEx sur fedex.ca pour plus de détails.

Accord sur les conditions. En nous faisant parvenir votre envoi, vous acceptez, que vous signiez ou non la première page de la présente Lettre de transport aérien, en votre propre nom et en tant qu'agent représentant toute autre personne ayant un intérêt dans cet envoi, toutes les conditions figurant sur la présente Lettre de transport aérien NON NEGOCIABLE, dans tout tarif en vigueur et dans le Guide des services de FedEx actuel (nous pouvons modifier, amender ou augmenter le Guide des services de FedEx actuel sans préavis), dont des exemples sont disponibles sur demande à l'une de nos succursales ou en téléphonant au 1.800.GoFedEx, 1.800.463.3338. En cas de conflit entre cette Lettre de transport aérien et la Lettre de transport aérien de FedEx actuel, ou les conditions normales alors en vigueur, le tarif prévaudra (le Guide des services de FedEx actuel a une priorité secondaire). En outre, la version anglaise de la présente Lettre de transport aérien prévaudra sur toute traduction. NUL N'EST AUTORISÉ À CHANGER OU À MODIFIER LES CONDITIONS DE NOTRE ACCORD. La présente Lettre de transport aérien créera des droits et obligations entre nous lorsque l'envoi sera accepté; nous pourrions estampiller cette Lettre de transport aérien d'un numéro d'employé faisant office de signature de notre part.

Vous obligations. Vous garantissez que chaque article faisant partie de l'envoi est correctement décrit sur la présente Lettre de transport aérien, que nous pouvons accepter de le transporter, et que l'envoi est correctement estampillé, adressé et emballé en vue de garantir son transport en toute sécurité, dans des conditions de manutention normales. Vous, l'expéditeur, serez toujours le principal responsable de tous les frais, y compris tous les frais de transport, et de tous droits, taxation douanières, pénalités et amendes gouvernementales, taxes, ainsi que de nos honoraires d'avocats et frais légaux relatifs à cet envoi. En outre, et sans que cela limite la portée générale de ce qui précède, vous devrez nous tenir indemnes de toute responsabilité civile, perte, réclamation, poursuite en dommages et dépense découlant de votre désobéissance aux lois, réglementations, ordonnances et exigences gouvernementales en vigueur.

NOTIFICATION CONCERNANT LES LIMITES DE RESPONSABILITÉ

Notification de transport routier. Le transport routier de votre envoi peut être régi par des lois, réglementations, ordonnances ou exigences des gouvernements fédéral et provinciaux, lesquelles peuvent encadrer et limiter notre responsabilité à l'égard des dommages, pertes, retards, livraison incomplète, erreurs de livraison, absence de livraison, information fautive ou incapacité de fournir de l'information sur votre envoi.

Limite de responsabilité. AU CAS OÙ ELLE NE SERAIT PAS RÉGIE PAR LA LÉGISLATION, LA RÉGLEMENTATION, UNE ORDONNANCE OU TOUTE EXIGENCE FÉDÉRALE OU PROVINCIALE TELLE QUE DÉCRITE CI-DESSUS, NOTRE RESPONSABILITÉ MAXIMUM POUR PERTE, DOMMAGE, RETARD, ERREUR DE LIVRAISON, ABSENCE DE LIVRAISON, INFORMATION FAUTIVE, INCAPACITÉ DE FOURNIR DE L'INFORMATION OU NON-TRANSMISSION DE L'INFORMATION CONCERNANT VOTRE ENVOI, MÊME SI CELA EST CAUSÉ PAR NOTRE NEGLIGENCE OU PAR NOTRE GROSSEIERE NEGLIGENCE, EST LIMITÉE PAR LA PRÉSENTE LETTRE DE TRANSPORT AÉRIEN À 100 \$CAN (OU PORTION CORRESPONDANTE PAR ENVOI, À MOINS QUE VOUS NE DECLARIEZ UNE VALEUR SUPÉRIEURE COMME PRÉCISÉ CI-DESSUS (SOUS RÉSERVE DES MONTANTS MAXIMUMS INDICQUÉS DANS LE GUIDE DES SERVICES DE FEDEX). NOUS N'OFFRONS AUCUNE GARANTIE NI ASSURANCE, MAIS VOUS POURRIEZ PAYER DES FRAIS SUPPLÉMENTAIRES POUR CHAQUE TRANCHE DE 100 \$CAN ADDITIONNELLE DE VALEUR DÉCLARÉE POUR LE TRANSPORT. SI VOUS DECLARÉZ UNE VALEUR DE TRANSPORT SUPÉRIEURE ET PAYEZ LES DITS FRAIS SUPPLÉMENTAIRES, NOTRE RESPONSABILITÉ MAXIMUM SERA ÉGALE AU MOINDRE DE VOTRE VALEUR DÉCLARÉE POUR LE TRANSPORT (SOUS RÉSERVE DES MONTANTS MAXIMUMS INDICQUÉS DANS LE GUIDE DES SERVICES DE FEDEX), DES FRAIS DE RÉPARATION DE L'ENVOI, DE LA VALEUR DÉPRÉCIEE, OU DES FRAIS DE REMPLACEMENT DU CONTENU.

Limites de valeur déclarée. On ne peut déclarer une valeur de transport supérieure à 1 000 \$ pour les envois contenant des articles de valeur extraordinaire. La valeur déclarée de transport la plus élevée que nous autorisons par lettre de transport aérien pour chaque envoi Enveloppe FedEx ou Pak FedEx est 100 \$. Veuillez consulter le Guide des services de FedEx actuel ainsi que tout tarif en vigueur pour plus d'explications sur les limites de valeur déclarée. Si vous envoyez plus d'un colis à l'aide de la présente Lettre de transport aérien, la valeur déclarée de transport pour chaque colis sera déterminée en divisant la valeur déclarée de transport totale par le nombre de colis dans l'envoi.

Responsabilités exclues. EN AUCUN CAS, NOUS NE SERONS RESPONSABLES DES DOMMAGES DIRECTS, FORTUITS, SPÉCIAUX OU INDIRECTS SUPÉRIEURS À LA VALEUR DÉCLARÉE DE TRANSPORT (Y COMPRIS, ENTRE AUTRES, LA PERTE DE REVENUS OU DE BÉNÉFICES), QUE NOUS AYONS OU NON EU CONNAISSANCE DE L'ÉVENTUALITÉ D'UN TEL DOMMAGE. Nous ne serons pas responsables de vos actes ou omissions, y compris, entre autres, toute déclaration de l'envoi inexacte, toute insuffisance d'emballage, de protection, d'estampillage ou d'indication d'adresse, ou tout acte ou omission du destinataire ou d'un tiers ayant un intérêt dans l'envoi. Nous ne serons pas responsables des dommages, pertes, erreurs de livraison, absence de livraison, information fautive, incapacité de fournir de l'information ou non-transmission de l'information concernant des envois d'espèces, devises ou autres articles prohibés. Nous ne serons pas responsables des pertes, dommages, retards, erreurs de livraison, absence de livraison, information fautive, incapacité de fournir de l'information ou non-transmission de l'information concernant votre envoi causés par des événements indépendants de votre volonté, y compris, entre autres, les cas de force majeure, dangers aériens, conditions météorologiques défavorables, actes d'ennemis publics, guerres, grèves, agitation civile ou actes ou omissions des autorités publiques (y compris les agents des douanes et de la santé) ayant l'autorité réelle ou apparente. VOUS DEVREZ COMMUNIQUER VOTRE-MÊME AVEC UN AGENT OU UN COURTIER D'ASSURANCE SI VOUS DESIREZ FAIRE ASSURER VOTRE ENVOI. NOUS NE FOURNISSEONS AUCUNE GARANTIE D'ASSURANCE.

Inexistence de garantie. Nous n'offrons aucune garantie, ni expresse, ni tacite.

Reclamations. TOUTES LES RECLAMATIONS DOIVENT ÊTRE EFFETUÉES PAR ÉCRIT ET DANS LES DÉLAIS PRÉSCRITS, conformément aux lois, réglementations, ordonnances ou exigences gouvernementales en vigueur. POUR PLUS DE DÉTAILS, VOIR LE GUIDE DES SERVICES DE FEDEX ACTUEL ET TOUT TARIF EN VIGUEUR. Tout droit de réclamer des dommages-intérêts sera perdu si vous n'entrez pas cette réclamation dans les deux ans suivant la date où l'envoi a été livré ou aurait dû l'être. Rien ne nous oblige à remédier à une réclamation tant que les frais de transport n'ont pas été entièrement payés. La réclamation peut ne pas être déduite de ces frais. Si le destinataire accepte votre envoi sans noter l'existence d'un dommage sur le bordereau de livraison, nous considérerons que l'envoi lui a été remis en bon état. Pour que nous puissions traiter vos réclamations pour dommage, vous devez conserver le contenu de l'envoi ainsi que les cartons et emballages d'expédition d'origine et nous permettre de les inspecter au lieu de livraison, en plus de conserver tout ce matériel jusqu'à ce que la réclamation ait été résolue.

Droit d'inspection. Votre envoi peut, à notre discrétion ou à la demande des autorités gouvernementales, être ouvert et vérifié par nous ou par lesdites autorités à tout moment.

Responsabilité de paiement. Même dans le cas où vous nous donneriez des instructions de paiement différentes, vous, l'expéditeur, serez toujours au premier titre responsable de tous les frais, y compris les frais de transport, et de tous droits, pénalités et amendes gouvernementales, taxes, ainsi que de nos honoraires d'avocat et frais légaux relatifs à cet envoi, en cas de défaut de paiement par le destinataire. Vous serez également responsable de tous les coûts que nous pourrions encourir pour le retour de votre envoi à vos locaux ou son entreposage en attendant tout arrangement.

Lettre d'instruction. Si vous ne remplissez pas tous les documents requis pour le transport, ou si les documents présentés par vous ne sont pas les documents qui conviennent aux services ou à la destination demandés, vous nous chargez par la présente, là où la loi le permet, de remplir, corriger ou remplacer les documents à votre place et à vos frais. Toutefois, nous n'y sommes pas obligés. Si un formulaire de remplacement de Lettre de transport aérien est requis pour la livraison de votre envoi et que nous remplissons ce document, les modalités de la présente Lettre de transport aérien continueront de prévaloir. Nous ne sommes pas responsables envers vous ou quiconque des actions que nous menons pour votre compte en vertu de la présente disposition.

Articles non transportables. Nous n'acceptons pas de transporter certains articles, et nous pouvons accepter de ne transporter certains autres articles que vers des destinations spécifiques ou sous certaines conditions. Nous nous réservons le droit de refuser des colis en vertu de ces restrictions ou pour des raisons de sécurité. Pour plus de détails, consultez le Guide des services de FedEx actuel, nos Conditions normales de transport ou tout tarif en vigueur.

Loi impérative. Dans la mesure où l'une des stipulations contenues ou indiquées dans la présente Lettre de transport aérien, dans le Guide des services de FedEx actuel ou dans tout tarif en vigueur est contraire à toute loi, réglementation, ordonnance ou exigence gouvernementale, ladite stipulation restera applicable en tant que partie de notre accord tant qu'elle n'aura pas été remplacée caduque. L'invalidité ou le caractère non exécutoire de toute stipulation n'affectera aucune partie de la présente Lettre de transport aérien, du Guide des services de FedEx actuel ou de tout tarif en vigueur.

Department of Transport

Supplemental Type Certificate

This approval is issued to:

AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta
Canada T2E 6R7

Number: SH12-58

Issue No.: 1

Approval Date:

Issue Date:

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

Bell 429

Registration/Serial No.:

All eligible

Canadian Type Certificate or Equivalent:

H-107 (Bell 429)

Description of Type Design Change:

Installation of External Attachment Provisions and Cargo Basket.

DRAFT

Installation/Operating Data, Required Equipment and Limitations:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL959-2, Revision 0, dated 28 September 2012, or later approved revision.

External Attachment Provisions installed in accordance with DCL959-2 may remain installed if the basket installation is removed.

Configuration B – External Cargo Basket:

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of Quick Release Cargo Basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL959-1, Revision 0, dated 28 September 2012, or later approved revision.

(continued)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

For Minister of Transport

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Cargo Basket Modifications:

Modifications to the Cargo Basket configurations are eligible in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL704, Revision 6, dated 29 April 2010, or later approved revision. Eligibility limitations are noted on the drawings.

Data Pertinent to All Configurations:

Transport Canada approved, AERO Design Ltd. Flight Manual Supplement FMS959.90, Revision 0, dated 08 November 2012, or later approved revision is required with this installation.

Transport Canada accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA959.91, Revision 0, dated 28 September 2012, or later accepted revision is required with this installation.

Basis of certification remains as defined in the applicable Type Certificate Data Sheets.

— End —

Title: Quick Release Cargo Basket
Approval: STC
Manufacture: Mfd by Aero Design (amend Approved Product List)
Customer: AERO Design Ltd.
Type and Model: Bell 429

Definition Of Change:

Description:

Installation of quick release cargo basket on Bell 429. Installation is similar to Bell 206L/407 configuration. Basket is same size as existing Bell 206L/407 ski basket, with the only difference being the lack of cutout for cross tube.

The basket mounts to the fuselage using the existing hardpoints for the cabin step. The step is removed and aluminum fittings are installed. The mounting beam then attaches to the fittings.

Primary Changes to the Aeronautical Product:

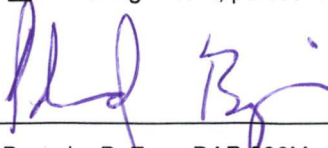
Removal of cabin steps on both sides; Installation of attachment fittings, installation of mounting beams, installation of cargo basket

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

None

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

None

| CHANGED PRODUCT RULE (CPR) DECISION RECORD | |
|--|--|
| NAPA No.: | |
| Step 1: Identify the proposed change to the aeronautical product. (Section 4.1 of AC 500-016) | The changes are as previously described. |
| Step 2: Is the change substantial? (Section 4.2 of AC 500-016) | <input type="checkbox"/> Yes A new type certificate is required. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 3 |
| Step 3: Will the latest standards be used? (Section 4.3 of AC 500-016) | <input type="checkbox"/> Yes Certification basis to use latest standards. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 4. |
| Step 4: Is the proposed change significant? (Section 4.4 of AC 500-016) | <input type="checkbox"/> Yes Proceed to Decision. <input checked="" type="checkbox"/> No Compliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). CPR Decision Process is Closed . |
| Decision: Will the latest standards be used? | <input type="checkbox"/> Yes Certification basis to use latest standards. CPR Decision Process is Closed . <input checked="" type="checkbox"/> No Proceed to Step 5, addressing each area separately (see below). |
| Identification of Affected Areas: | The area(s) affected by the proposed change have been detailed in Compliance Program: CP959 |
| Note: A delegate may develop a proposal for the Yes/No decision of Step 6, however, TCCA will make the final determination. | |
| Area: | |
| Step 5: Is this area affected by the proposed change? (Section 6.1 of AC 500-016) | <input type="checkbox"/> Yes Proceed to Step 6. <input type="checkbox"/> No Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification basis defined or documented as indicated below. |
| Step 6: Are the latest standards practical and do they contribute materially to the level of safety? (Section 6.2 of AC 500-016) | <input type="checkbox"/> Yes Certification basis to be established using latest standards. <input type="checkbox"/> No Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below. |
| <input type="checkbox"/> Continuation Sheet(s) Attached | Note: Several standards may apply to each area and the assessment may differ from standard to standard. Indicate Yes if compliance with any latest standard(s) will be required. Indicate No only if no later standards are to be applied. |
| Certification Basis | The certification basis is as follows or as detailed in the listed document(s): Bell 429, TCDS H-107: Airworthiness Manual Chapter 527, including at Change 527-6, including Appendix B for IFR and Appendix C for Category A. Appendix C specifies certain sections of AWM Chapter 529. For these specified sections, AWM Chapter 529 at Change 529-6 is applicable. |
| Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is. (check one) | |
| <input type="checkbox"/> substantial, pursuant to subsection 511.14 or 513.14 of the CARs <input type="checkbox"/> significant, pursuant to subsection 511.13(3) or 513.07(3) of the CARs <input checked="" type="checkbox"/> not significant, pursuant to subsection 511.13(3) or 513.07(3) of the CARs | |
|  | |
| E. Burgoin, P. Eng., DAR 290M | 13 November 2012 |
| | Date |

A In accordance with CAR 521 AERO Design Ltd. hereby
Company to hold the approval document(s):
undertake to carry out the responsibilities of a design approval document holder,
as set out in Division VIII of Part V, Subpart 21 of the CARs, regarding:

1. Technical capability,
2. Service difficulty reporting,
3. Establishing a service difficult reporting system,
4. Investigation of service difficulty reports,
5. Mandatory changes,
6. Transfers,
7. Record keeping and loss or disposal of records,
8. Manuals,
9. Instructions for continued airworthiness, and
10. Supplemental integrity instructions

The responsibilities noted above are with reference to the data which may be found with one or more of the following numbers:

Transport Canada file number: C-12-0852

and / or

Project Reference number: 959

and / or

Approval Number: SH12-58

X

Signature of Holder's authorized person:

13 Nov 2012

Date:

DAR 290M

Position / Title:

B Pursuant to the requirements of the CARs, Part V, Subpart 521, Chapter 160:
AERO Design Ltd. agrees to administer the preceding responsibilities on
behalf of the holder of the approval(s) below, on a fee for service basis.

per: _____
Signature

X _____
Signature of Holder's authorized person:

E. Burgoin Consultant
Print Name Title

Print Name

Date:

Date



**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**

**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**

| | | | |
|--|--|--|--|
| 1. Reference No. / N° de référence NAPA File C-12-0852 Aero Design Project #959 | | 2. Applicant Name / Nom de demandeur Aero Design Ltd. | |
| Part 1: Identification of Aeronautical Product Partie 1 : Identification des produits aéronautiques | | | |
| 3. Applicable Design Approval Document No. / N° du document d'approbation de la conception applicable H-107 | | | |
| 4. Model No. / N° de modèle 429 | | 5. Make / Marque Bell Helicopters Textron Inc. | |
| 6. Type (aircraft, engine, propeller, appliance, part) / Type (aéronef, moteur hélice, appareillage, pièce) Aircraft | | | |
| Part 2: Substantiating Reports and Data Partie 2 : Rapports et des données pertinentes | | | |
| 7. Number / Numéro DCL959-1 Revision 0 | | 8. Title / Titre Document Control List, and all documents referenced therein. | |
| DCL959-2 Revision 0 | | Document Control List, and all documents referenced therein. | |
| | | | |
| 9. Purpose of Finding of Compliance / But de la constat de conformité <input checked="" type="checkbox"/> New approval: <input checked="" type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Supplemental Type Certificate-Limited <input type="checkbox"/> Repair Design Certificate <input type="checkbox"/> Other: Installation of quick release cargo basket. <input type="checkbox"/> Revise existing approval # The revised data requires the revision of the approval document. The revised data is within the scope of the accepted Certification Plan. | | | |
| 10. Applicable Elements of Certification Basis / Éléments applicables de la base de certification <input checked="" type="checkbox"/> Certification Plan: CP959 <input checked="" type="checkbox"/> Letter of exention of delegation, dated: 13 November 2012 | | | |
| Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis Partie 3 : Délégué ministériel constat de conformité avec la base de certification | | | |
| Under the authority vested in me by the Minister under subsection 4.3(1) of the <i>Aeronautics Act</i> , I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge. | | En vertu des pouvoirs qui m'ont été conférés par le ministre conformément au paragraphe 4.3(1) de la <i>Loi sur l'Aéronautique</i> , j'estime que, à ma connaissance, la définition de type du produit aéronautique est conforme à sa base de certification tel qu'il a été démontré par les rapports et les données pertinentes fournis par le demandeur. | |
| 11. Signature of Delegate(s) Signature des délégués | 12. Name / Nom E. Burgoin, Aero Design Ltd. | 13. Delegate No. / N° de délégué DAR 290M | 14. Date (yyyy-mm-dd) Date (aaaa-mm-jj) 2012-11-14 |


**MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE
WITH THE CERTIFICATION BASIS**
**DÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ
AVEC LA BASE DE CERTIFICATION**

Block 7 (continued from sheet 1)

| Document Number | Revision | Title | Comment |
|-----------------|----------|---|---------|
| DCL959-11 | 0 | Document Control List and all documents referenced therein. | |
| DCL959-12 | 0 | Document Control List and all documents referenced therein. | |
| DCL704 | 7 | Document Control List and all documents referenced therein. | |
| ER959.01 | 0 | Engineering Report | |
| ER959.02 | 0 | Engineering Report | |
| ER842.01 | 0 | Engineering Report | |
| 95901 | 0 | Cargo Basket Installation | |
| 95902 | 0 | Mounting Provisions Installation | |
| 95910 | 0 | Cargo Basket Assembly | |
| 95911 | 0 | Basket Fabrication | |
| 95912 | 0 | Lid Fabrication | |
| 95915 | 0 | Basket Components - Forward Sheet | |
| 95916 | 0 | Basket Components - Filler Sheets | |
| 95917 | 0 | Basket Components - Lid Checker Plate | |
| 95920 | 0 | Forward Fitting Fabrication | |
| 95921 | 0 | Aft Fitting Fabrication | |
| 95922 | 0 | Plates Fabrication | |
| 95923 | 0 | Bushings Fabrication | |
| 95925 | 0 | Basket Components - Forward Attachment Hoop | |
| 95926 | 0 | Basket Components - Aft Attachment Hoop | |
| 95927 | 0 | Basket Components - Placard | |
| 95930 | 0 | Forward Beam Fabrication | |
| 95931 | 0 | Aft Beam Fabrication | |
| 94520 | 0 | Basket Components - Hoop | |
| 49215 | 0 | Basket Components - Spacer | |
| 49216 | 0 | Basket Components - Spacer | |
| 84255 | 1 | Handle Assembly | |
| 84261 | 1 | Handle Bar Assembly | |
| 84262 | 1 | Handle Bracket Assembly | |
| 84265 | 1 | Handle Lever | |
| 84267 | 0 | Handle Bracket | |
| 84272 | 0 | Bushing | |
| 36273 | 1 | Lid Bracket | |
| 36274 | 2 | Bushing | |
| 36275 | 3 | Bushing | |
| 36277 | 0 | Handle Bar | |
| 36278 | 2 | Spring | |

| | | |
|---------|---|------------------------------|
| ▪ 36280 | 2 | Brace |
| ▪ 70403 | 4 | Auxiliary Latch Modification |
| 70408 | 0 | Hangar Wheel Modification |

Documents listed below this line (if any) cannot be approved by the delegate:

| | | |
|-----------|---|---|
| | | Flight Test Report – Transport Canada Flight Test |
| FMS959.90 | 0 | Flight Manual Supplement |
| ICA959.90 | 0 | Instructions for Continued Airworthiness |

DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Quick Release Cargo Basket, as detailed in the data approved by Transport Canada approval SH12-58, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file C-12-0852.

per:



Signature

E. Burgoin

Print Name

Consultant

Title

14 November 2012

Date

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 06 September 2012
REV. No. 1 08 Nov 2012

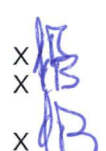
CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 429

REGISTRATION: All Applicable
SERIAL No.: All Applicable



NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: CAR527, Change 527-6
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-6

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|-----------------------------------|---|-------------------------------------|------|---|---|
| Subpart B – Flight | | | | | |
| 527.27 | Centre of Gravity Limits | N/A | | | No change from Type Approval. |
| 527.29 | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | | X | |
| 527.51 | Takeoff | Flight Test | M.B. | | Flight tests to be performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter |
| 527.65 | Climb: All Engines Operating | Flight Test | M.B. | | |
| 527.67 | Climb: One Engine Inoperative | Flight Test | M.B. | | |
| 527.71 | Gliding Performance | Flight Test | M.B. | | |
| 527.75 | Landing | Flight Test | M.B. | | |
| 527.141 | Flight Characteristics – General | Flight Test | M.B. | | |
| 527.143 | Controllability and Maneuverability | Flight Test | M.B. | | |
| 527.171 | Stability – General | Flight Test | M.B. | | |
| 527.173 | Longitudinal Stability | Flight Test | M.B. | | |
| 527.175 | Demonstration of Longitudinal Stability | Flight Test | M.B. | | |
| 527.177 | Static Directional Stability | Flight Test | M.B. | | |
| 527.231 | Ground and Water Handling - General | Flight Test | M.B. | | |
| 527.241 | Ground Resonance | Flight Test | M.B. | | |
| 527.251 | Vibration | Flight Test | M.B. | | |
| Subpart C – Strength Requirements | | | | | |
| 527.301 | Loads – Air Drag Loads | Analysis | X |  | |
| 527.301 | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | X | | |
| 527.303 | Factor of Safety | Analysis | X | | |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|--|------------------------------------|------|-----|---|
| 527.305 | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.307 | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | Critical load factor in downward direction. |
| 527.547 | Main Rotor Structure | Flight Test | M.B. | | See comments for flight test above |
| 527.561 | Emergency Landing Conditions | | | | |
| 527.561(a) | General | N/A | | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |
| Subpart D – Design and Construction | | | | | |
| 527.601 | Design | Drawings | | X | Design is conventional. |
| 527.603 | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 | Protection of Structure | Drawings | | X | |
| 527.611 | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 | Fitting Factor | Analysis | | X | |
| 527.727 | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.783 | Doors | N/A | | | Installation does not block doors. |
| 527.787(a) | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 | External Load Attaching Means | N/A | | | Cargo basket is classified as a cargo compartment |
| 527.1387 | Position Light System Dihedral Angles | Statement | | ** | Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|---|------|--|--|
| 527.1401 | Anti-collision Light System | Statement | | **  | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 | Never Exceed Speed | Flight Test, Flight Manual Supplement | M.B. | | V _{NE} limits to be verified by flight test. |
| 527.1525 | Kinds of Operation | Flight Manual Supplement | M.B. | | Limited to VFR only. |
| 527.1529 | Instructions for Continuing Airworthiness | ICA Provided | M.B. | | |
| 527.1557(a) | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | X  | |
| 527.1557(b) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 | Rotorcraft Flight Manual – General | Flight Manual Supplement | M.B. | | |
| 527.1583(c) | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | M.B. | | |
| 527.1585 | Operating Procedures | Flight Manual Supplement | M.B. | | |
| 527.1587 | Performance Information | Flight Manual Supplement | M.B. | | |
| 527.1589 | Loading Information | Flight Manual Supplement & Placard | M.B. | | Placard installed on basket |
| Airworthiness Manual Requirements | | | | | |
| 5527.1581(e) | Rotorcraft Flight Manual – Units | SI and Imperial Units provided in Flight Manual Supplement | M.B. | | |

Note: M.B. indicates items being signed of by Michel Brulotte.

BELL 429

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the **INSTALLATION of the AERO DESIGN** **QUICK RELEASE CARGO BASKET**

Canadian Supplemental Type Certificate No. SH12-58
FAA Supplemental Type Certificate No. XX
EASA Supplemental Type Certificate No. XX

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 407 when fitted with the Quick Release Cargo Basket or Quick Release Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

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| I | Limitations | 3 |
| II | Normal Procedures | 3 |
| III | Emergency Procedures | 3 |
| IV | Performance | 4 |
| V | Weight and Balance | 5 |
| VI | Installation / removal instructions | 7 |

Record of Revisions

| Revision | Issue Date | Pages Revised | Date Inserted | By |
|----------|------------|---------------|---------------|----|
| 0 | 8 Nov 2012 | None | | |
| | | | | |
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| | | | | |

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (136 kg).
2. V_{NE} is 130 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.
3. For Category A operations with the Cargo Basket installed, a weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

With the cargo basket installed:

1. AEO and OEI Climb performance is reduced by up to 100 fpm.
2. Cruise performance and range are reduced.
3. Category A Performance – A weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.

V WEIGHT AND BALANCE

1. The following weight and balance is for the quick release cargo basket configuration, installed in accordance with drawing 95901.

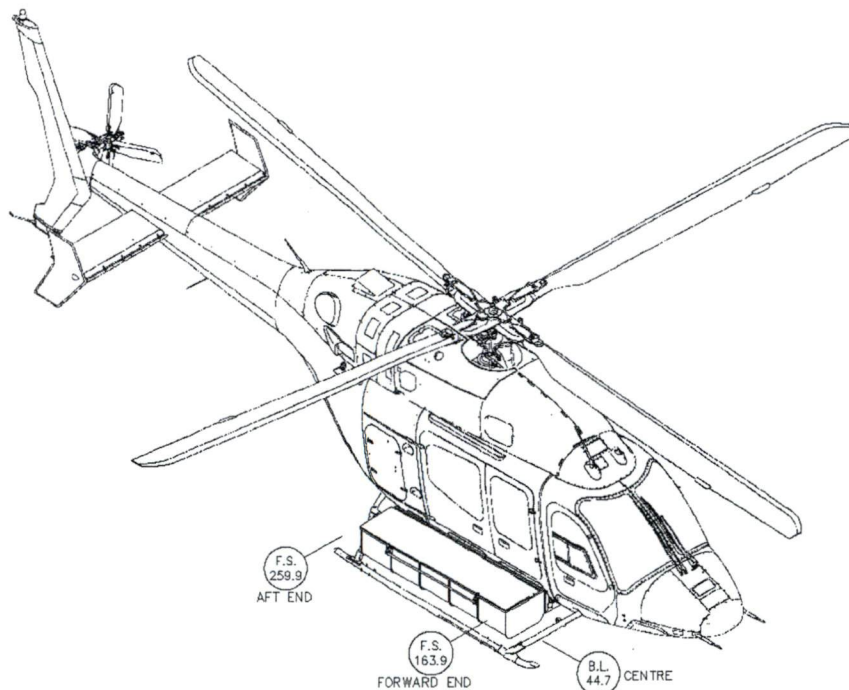


Figure V.1 – Quick Release Cargo Basket (95901 Configuration)

Quick Release Cargo Basket Configuration

| Item | Weight | Longitudinal | | Lateral | |
|-----------------------------|---------|--------------|----------------|---------|---------------|
| | | Arm | Moment | Arm | Moment |
| Basket Only ¹ | 71.2 lb | 211.9 in | 15 084.4 in*lb | 44.7 in | 3182.6 in*lb |
| | 32.3 kg | 5381 mm | 173 792 mm*kg | 1135 mm | 36 668 mm*kg |
| Cargo ² (MAX) | 300 lb | 211.9 in | 63 558.0 in*lb | 44.7 in | 13410.0 in*lb |
| | 136 kg | 5381 mm | 732 268 mm*kg | 1135 mm | 154 500 mm*kg |

AERO DESIGN LTD.

FMS959.90

¹ Weight and balance is for Cargo Basket only. Mounting beams and attachment provisions are not included since they are included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Provisions are installed in accordance with drawing 95902. The Quick Release Basket is installed in accordance with drawing 95901. Removal of the basket leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required.

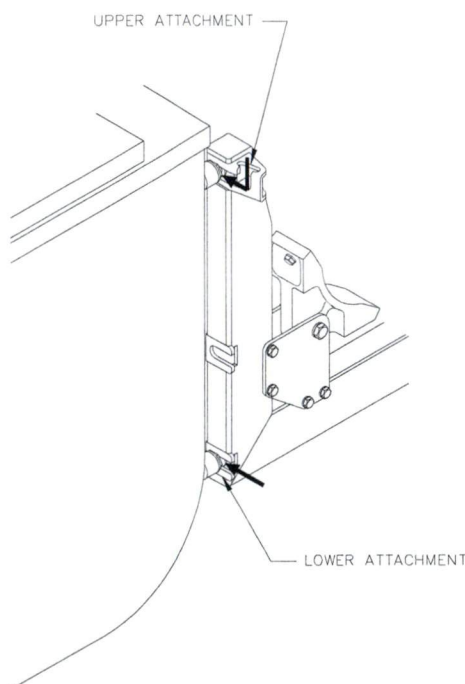


Figure VI.1 – Forward Basket Attachment

1. Basket Installation - Refer to Figure VI.1 and VI.2.
 1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
 2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.
 3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.
 4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.

5. Check that basket is locked in place by attempting to lift aft end of basket.

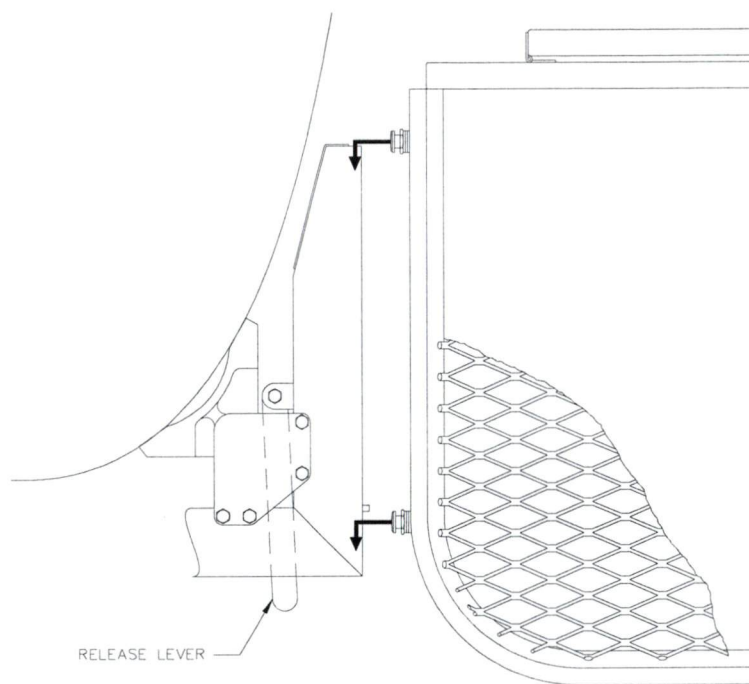


Figure VI.2 – Aft Basket Attachment

2. Basket Removal - Refer to Figure VI.1 and VI.2.
 1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
 2. Lift basket until upper attachment is out of keyway on aft beam.
 3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
 4. Lower aft end of basket to the ground.
 5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

| | |
|---|---|
| Name of the applicant for the design change approval: | Aero Design Ltd. |
| Description of the design change: | Installation of Quick Release Cargo Baskets on Bell 429 |
| Certification Basis of design change and revision date: | CAR 527, Change 527-6 |
| CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed: | Section 0-3 of Supplemental ICA (ICA 959.91) |
| CAR Standard 513.05 (1) (g) (iv): Installation Instructions: | Installation Drawing 95901, 95902 |

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

| Regulatory Standard Reference Column 1 | Design Approval Holder (DAH) ICA Reference Column 2 | Applicant Means of Compliance Supplemental ICA Requirements Column 3 |
|--|---|--|
| A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided. | ICA ref: Bell 429 Maintenance Manual, BHT-429-MM | Supplemental ICA ref: Single Manual (ICA959.91) |
| A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement. | ICA ref: Bell 429 Maintenance Manuals | Supplemental ICA ref: Arranged in ATA format |
| A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information: | | |
| A527.3 (a) Rotorcraft maintenance manual or section | | |
| A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance. | ICA ref: Bell 429 Maintenance Manual, Chapter 1 | Supplemental ICA ref: Section 0-1 |
| A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances. | ICA ref: Bell 429 Maintenance Manual, Chapter 1 | Supplemental ICA ref: Section 0-5, 0-6 |

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

| Regulatory Standard Reference Column 1 | Design Approval Holder (DAH) ICA Reference Column 2 | Applicant Means of Compliance Supplemental ICA Requirements Column 3 |
|--|---|--|
| A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply. | ICA ref: N/A | Supplemental ICA ref: N/A |
| A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information. | ICA ref: Bell 429 Maintenance Manual, Chapter 12 | Supplemental ICA ref: N/A |
| A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information: | | |
| A527.3 (b) Maintenance Instructions. | | |
| A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft. | ICA ref: Bell 429 Maintenance Manual, Chapter 5 | Supplemental ICA ref: Section 5-1 |
| A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions. | ICA ref: N/A | Supplemental ICA ref: N/A |

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

| Regulatory Standard Reference Column 1 | Design Approval Holder (DAH) ICA Reference Column 2 | Applicant Means of Compliance Supplemental ICA Requirements Column 3 |
|--|--|--|
| A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken. | ICA ref: Bell 429 Maintenance Manual, Chapter 25 | Supplemental ICA ref: Section 25-1 thru 25-10 |
| A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations. | ICA ref: Bell 429 Maintenance Manual, Chapter 7 and 8 | Supplemental ICA ref: Section 25-11 |
| A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided. | ICA ref: N/A | Supplemental ICA ref: N/A |
| A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified. | ICA ref: Bell 429 Maintenance Manual, Chapter 5 | Supplemental ICA ref: Section 5-1 |
| A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection. | ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3 | Supplemental ICA ref: Section 5-3 |
| A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values. | ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2 | Supplemental ICA ref: Section 25-12 |
| A527.3 (g) Special tools (g) A list of special tools needed. | ICA ref: N/A | Supplemental ICA ref: N/A |

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."

ICA ref: Bell 429 Maintenance Manual,
Chapter 4

Supplemental ICA ref: Chapter 4

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: _____

Date: 12 November, 2012

Applicants Name: E. Burgoin, P.Eng, DAR 290M

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number _____

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 959.91

BELL 429

QUICK RELEASE CARGO BASKET

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket installed in accordance with the following AERO Design Ltd. Document Control Lists:

- DCL959-1, Revision 0 (Cargo Basket Installation)
- DCL959-2, Revision 0 (Mounting Provisions Installation)

or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 0
Date: 28 September, 2012

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesign.ca

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RECORD OF REVISIONS

| Revision Number | Issue Date | Date Inserted | By |
|-----------------|--------------|---------------|----------------|
| 0 | 28 Sept 2012 | | Original Issue |
| | | | |
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LIST OF EFFECTIVE PAGES

List of Revisions

Revision 0 (Original Issue) 28 September 2012

List of Effective Pages

| <u>Description</u> | <u>Pages</u> | <u>Revision No.</u> |
|---|--------------|---------------------|
| Cover | 1 | 0 |
| Revision Record/List of Effective Pages | 2 | 0 |
| Table of Contents | 3 | 0 |
| 00-00-00 | 4-5 | 0 |
| 04-00-00 | 6 | 0 |
| 05-00-00 | 7-10 | 0 |
| 11-00-00 | 11 | 0 |
| 25-50-00 | 12-21 | 0 |

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of Canadian Aviation Regulations (CAR) 527.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness
LH - Left Hand
RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

AERO Design Ltd.
2013 39th Avenue N.E.
Calgary, Alberta
T2E 6R7
Fax: 403-250-8333
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

This installation is not compatible with float installations.

0-5 GENERAL DESCRIPTION

The cargo basket is installed in accordance with drawing 95901. The basket is 97" long, 25.5" wide, and 18.25" high (2464 mm, 648 mm, 464 mm respectively), and is made of a steel welded tubing structure, lined with expanded steel mesh. The basket has a hinged lid with a locking handle and secondary automatic safety catch.

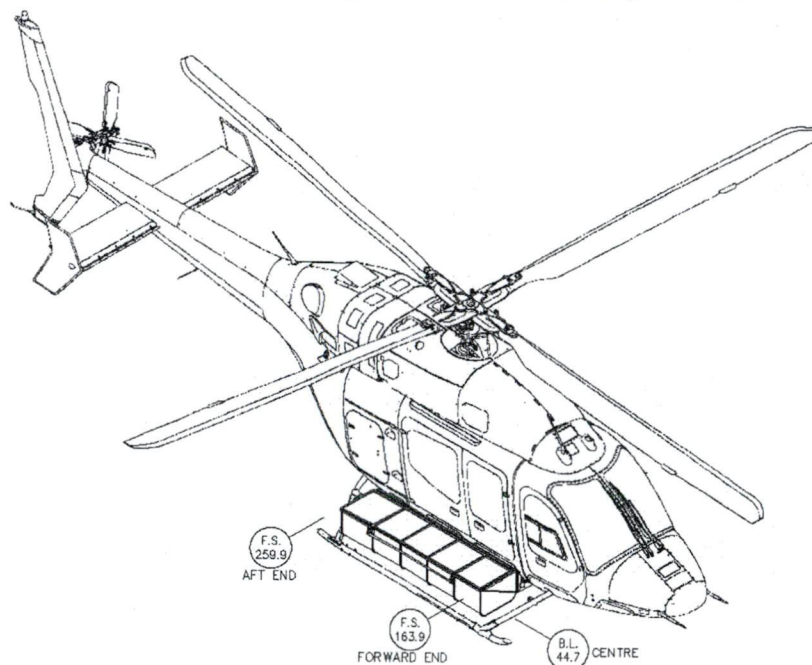


Figure 0.1 – Cargo Basket Installation

0-6 STRUCTURAL PROVISIONS

The Attachment Provisions are installed on the helicopter in accordance with drawing 95902. The attachment provisions consist of four fittings that are installed on the helicopter mounting points for the cabin step, which is removed from both sides.

The beams are steel tubing which attach to the fittings on the fuselage and stick out from the side of the helicopter. The quick release mechanism is built into the beams. It allows for the installation and removal of the basket quickly without tools, leaving the mounting beams in place.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket
 - a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain basket, replace spring, refer to section 25-10.
 - b) Inspect latching of the lid for correct operation. Replace handle brackets on basket if handle is not retained in latched position, refer to section 25-8. Replace handle springs if handle is not held in towards brackets, refer to section 25-9.

200 Hour or Annual Inspection

1. Inspection Area: Basket
 - a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
 - b) Visually inspect basket mesh for damage.
2. Inspection Area: Beams
 - a) Visually inspect beams attaching basket to the helicopter for cracks, corrosion or other damage.
 - b) Visually inspect lugs attaching the basket to the beams for security and damage.
 - c) Visually inspect plates attaching beams to attachment provisions for cracks, corrosion or other damage.
 - d) Visually inspect bolts attaching beams to external attachment provisions for security and damage.
3. Inspection Area: Attachment Provisions
 - a) Visually inspect each fitting for cracks, corrosion or other damage.
 - b) Visually inspect bolts attaching fittings to fuselage for condition and security.
4. Inspection Area: Forward Cross Tube
 - a) Visually inspect condition of erosion tape on forward cross tube, directly forward of cargo basket.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 200 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket and Lid Tubing*Damage Limits:*

- a) Deformation of any tubing between welded joints not exceeding 0.25 inches in any direction must be repaired in accordance with the instructions below.
- b) Corrosion not exceeding 0.015 inches deep to be dressed out to a smooth contour.
- c) Corrosion exceeding 0.015 inches deep to be repaired in accordance with the instructions below.

Repair Instructions:

- a) Repair Basket and Lid tubing in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, paragraphs 4-80, 4-81 and 4-83 as required.

Basket and Lid are fabricated from the following materials:

Basket Hoops, Spine: 1/2" square steel tube

Lid, Basket Rim: 3/4" square steel tube

- b) Touch up with polyurethane paint as required following repairs.

2. Basket and Lid Mesh*Damage Limits:*

- a) The basket mesh may be deformed or stretched without limit, so long as the welds attaching the mesh to the basket or lid are not compromised. If welds are compromised, repair in accordance with instructions below.
- b) Tears in the mesh not exceeding 4 cells in any direction may be repaired by patching. Maximum one repair patch per bay. See instructions below.

Repair Instructions:

- a) Repair mesh to tube welds in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.

Mesh: 3/4" 16 ga. (0.040") expanded steel mesh

- b) Patch repair:

- a. Cut two aluminum sheets, minimum 0.040 inches thick, extending to at least 1 complete cell outside of torn area. Drill #9 holes in the corners of the sheet, located to clear the mesh when installed.
- b. Attach patches, one inside and one outside, to the mesh with AN3 Bolts, AN970-3 Washers, and MS21044N3 Nuts.

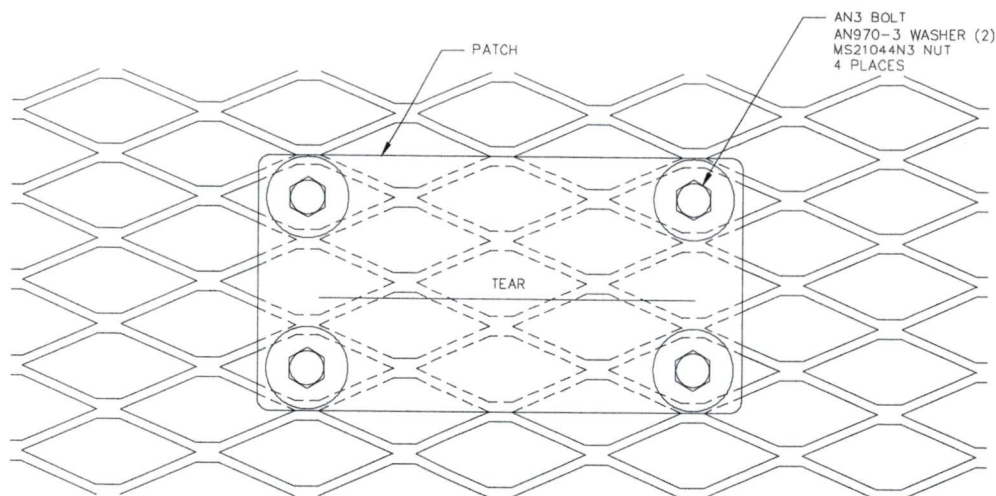


Figure 5.1 – Patch Repair

- c) Touch up with polyurethane paint as required following repairs.

3. Beams

Damage Limits:

- a) Critical slot dimensions are shown in Figure 5.2.

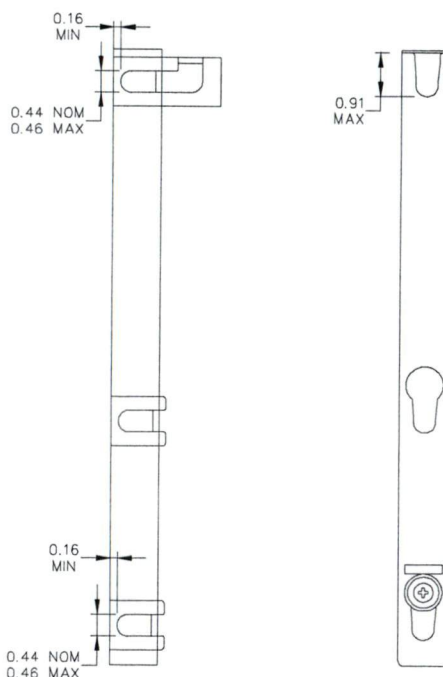


Figure 5.2 – Critical Beam Slot Dimensions

- b) Attempt to insert 15/32 drill shank into bottom end of vertical slot in aft beam. If drill can be inserted, slot is worn beyond limit.
- c) Nicks and/or gouges on the top or bottom faces up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.

- d) Nicks and/or gouges on the side faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- e) Cracks at any location on the beam are not acceptable.
- f) Touch up with polyurethane paint as required following repairs.

Repair Instructions:

Do not repair damage to beams if beyond limits specified. Replace beams in accordance with section 25-7.

4. Plates

Damage Limits

- a) Nicks and/or gouges on any surface up to 0.015" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Cracks on any surface are not acceptable.
- c) Corrosion on any surface up to 0.015" deep, not exceeding 1 square inch may be dressed out to a smooth contour.

Repair Instructions

Replace plates if damage exceeds limits above. See section 25-7.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The beams are supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

2. Cargo Basket

The cargo basket is supplied powder coated white. If the powder coat is damaged, touch up with white polyurethane paint.

3. Attachment Fittings and Plates

The attachment fittings and plates are supplied anodized. If the anodizing is damaged, parts are to be cleaned, primed and painted in accordance with Bell Standard Procedures Manual, BHT-SPM-ALL, Chapter 4 and Chapter 5.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation in the locations noted:

- a) Located on basket lid:



CHAPTER 25 – EQUIPMENT AND FURNISHINGS**SECTION 50 – CARGO COMPARTMENTS****25-1 CARGO BASKET REMOVAL**

Refer to Figure 25.1 and 25.2.

1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
2. Lift basket until upper attachment is out of keyway on aft beam.
3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
4. Lower aft end of basket to the ground.
5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.

25-2 CARGO BASKET INSTALLATION

Refer to Figure 25.1 and 25.2.

1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.

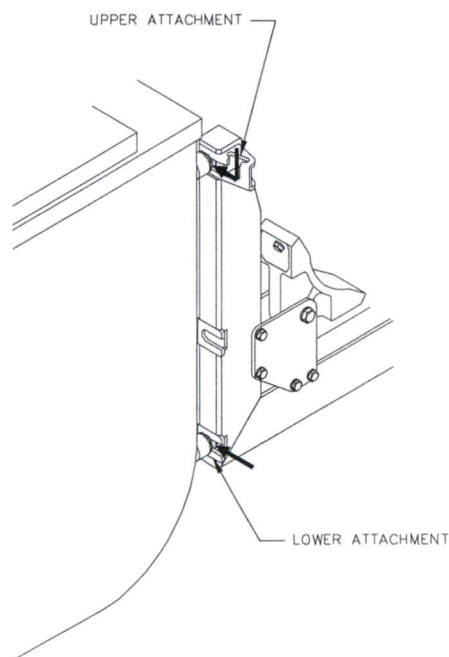


Figure 25.1 – Basket Forward Attachment

3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.

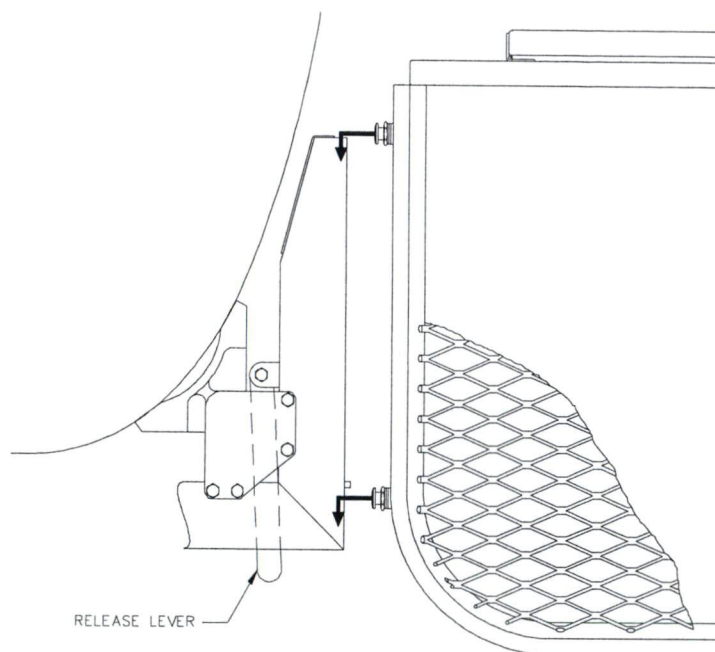


Figure 25.2 – Basket Aft Attachment

4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.
5. Check that basket is locked in place by attempting to lift aft end of basket.
6. If required, install abrasion strip on forward cross tube. See section 25-7.

25-3 MOUNTING BEAMS REMOVAL

Refer to Figure 25.3 and 25.4.

1. Remove Cargo Basket. Refer to section 25-1.
2. At aft mounting beam, remove AN4-16A Bolt, NAS1149F0463P Washer (2) and MS21044N4 Nut that attach 95922-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95922-02 Plates to attachment fitting on opposite side. Remove 95931-01-00 Aft Beam from helicopter.
3. At forward mounting beam, remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach 95922-01 Plates on mounting beam to attachment fitting on basket side of beam. Lower beam to ground. Remove AN4-16A Bolt, NAS1149F0463 Washer (2) and MS21044N4 Nut that attach remaining 95922-02 plates to attachment fitting on opposite side. Remove 95930-01-01/-02 Forward Beam from helicopter.
4. Remove four 95923-01 Bushings from attachment fittings.

5. If required, remove hardware, bushings, and plates from beams prior to storage.

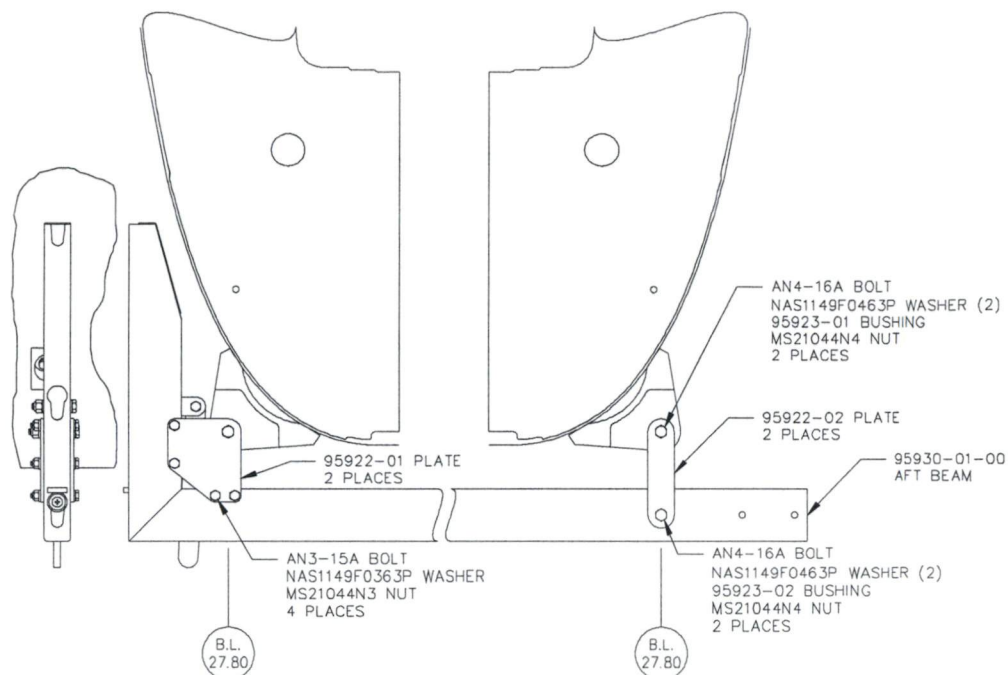


Figure 25.3 – Aft Beam Removal / Installation
Looking Aft, Right Hand Installation Shown

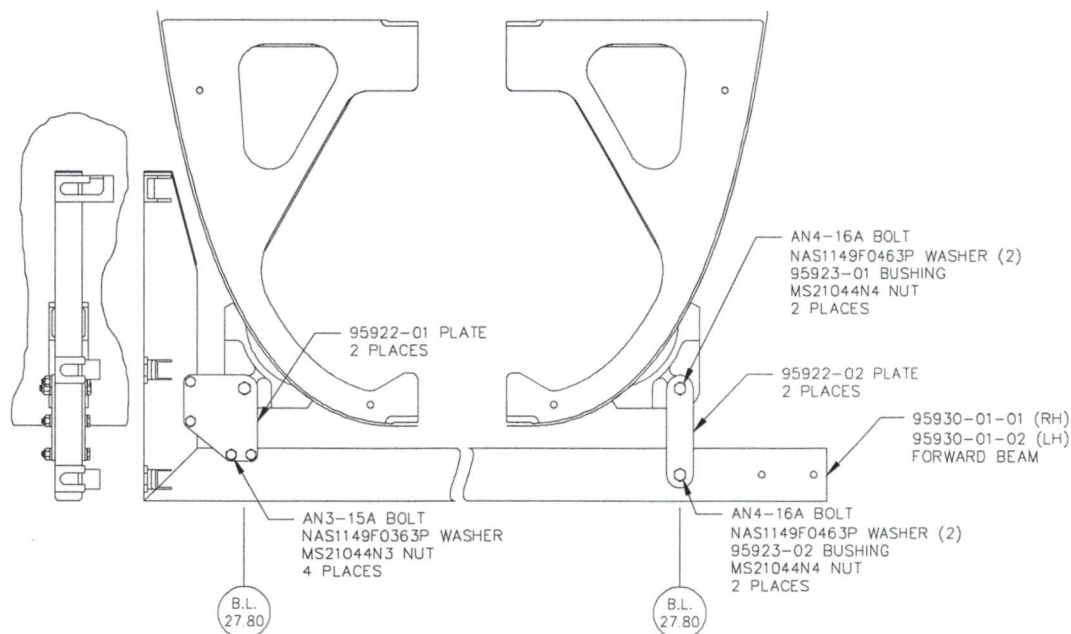


Figure 25.4 – Forward Beam Removal / Installation
Looking Aft, Right Hand Installation Shown

25-4 MOUNTING BEAMS INSTALLATION

Refer to Figure 25.3 and 25.4.

1. Attachment Provisions installed in accordance with section 25-6 are required prior to installing the Mounting Beams.
2. If required, install two 95922-01 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using four AN3-15A Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut. Torque nuts to 20-25 inch-lbs (2-3 N-m).
3. If required, install two 95922-02 Plates on 95930-01-01/-02 Forward Beam and 95931-01-00 Aft Beam using one AN4-16A Bolt, NAS1149F0463P Washer (2), 95923-02 Bushing and MS21044N4 Nut. Do not tighten nuts, plates must be free to move.
4. Insert four 95923-01 Bushing in each attachment fitting on fuselage.
5. Raise horizontal section of forward beam up to forward attachment fitting on helicopter. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
6. Raise forward beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
7. Raise horizontal section of aft beam up to forward attachment fitting on helicopter. Attach 95922-02 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing. Leave opposite end resting on ground.
8. Raise aft beam up to opposite attachment fitting. Attach 95922-01 Plates to fitting using one AN4-16A Bolt, NAS1149F0463 Washer (2), and MS21044N4 Nut through 95923-01 Bushing.
9. Torque MS21044N4 nuts to 50-70 inch-lbs (6-8 N-m).

25-5 ATTACHMENT FITTINGS REMOVAL

Refer to Figure 25.5.

1. Mounting Beams must be removed prior to removal of the Attachment Fittings. See section 25-3
2. Remove the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:
 - a. Access Cover, station 184.0 (300AL and 300AR)
 - b. Access Cover, station 224.0 (300BL and 300BR)
3. Remove two NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut from each attachment fitting.
4. Remove two 95920-01 Forward Fitting, 95921-01 Aft Right Fitting, and 95921-02 Aft Left Fitting from helicopter.

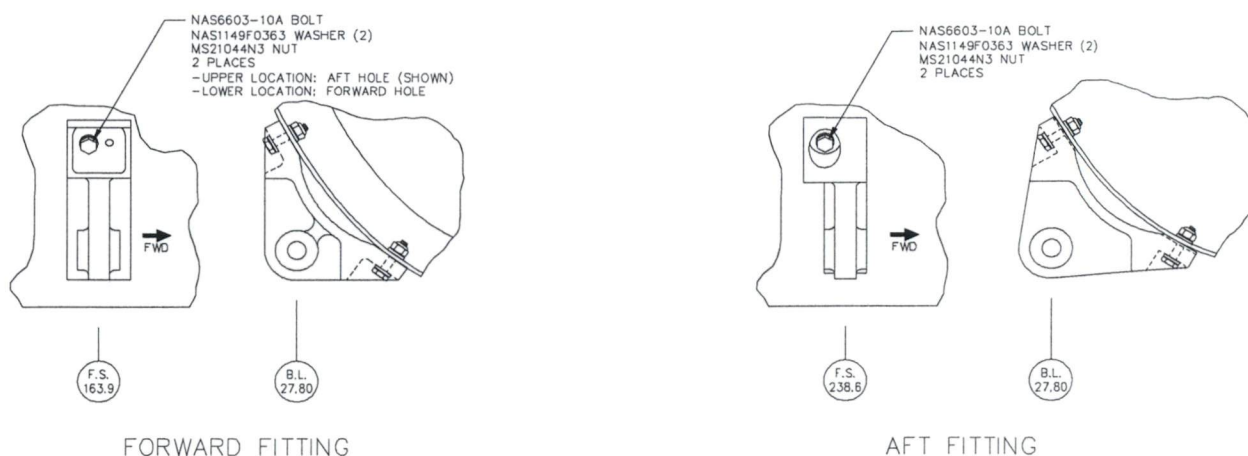


Figure 25.5 – Attachment Fittings Removal / Installation
(Right side shown, left side opposite)

25-6 ATTACHMENT FITTINGS INSTALLATION

Refer to Figure 25.5.

Materials Required: C-251 Sealant (ref: BHT-ALL-SPM)

1. Passenger Step Assembly must be removed prior to installation of the Attachment Fittings. Refer to Bell 429 Maintenance Manual, BHT-429-MM-1, section 32-57.
2. At the location of the forward and aft fittings, make sure the faying surfaces of the fitting assembly and fuselage skin are clean and prepared for bonding. Otherwise, refer to the BHT-ELEC-SPM, Chapter 8
3. At four locations, apply sealant (C-251) to the faying surfaces of the fitting assembly and the fuselage skin.
4. Apply sealant (C-251) to the shanks of the bolts. Do not apply sealant to the bolt threads. Install while sealant is wet.
5. Install 95920-01 Forward Fitting on right hand forward step location on fuselage using NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut. Repeat for left side.
6. Install 95921-01 Aft Right Fitting on right hand aft step location on fuselage using NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut.
7. Install 95921-02 Aft Left Fitting on right hand aft step location on fuselage using NAS6603-10 Bolt, NAS1149F0363P Washer (2), and MS21044N3 Nut.
8. Torque nuts (8) to 20-25 inch-lbs (2-3 N-m).
9. At centre step support locations on fuselage, install two AN3-4A Bolt, NAS1149F0363 (2) Washer, and MS21044N3 Nut. Torque nuts to 12-15 inch-lbs (1.5-2 N-m).
10. Overcoat the fasteners with sealant (C-251).

11. Install the following access covers on both sides in accordance with Bell 429 Maintenance Manual, BHT-429-MM-1, Chapter 53:

- a. Access Cover, station 184.0 (300AL and 300AR)
- b. Access Cover, station 224.0 (300BL and 300BR)

25-7 ABRASION STRIP INSTALLATION

Abrasion strip is to be installed to protect forward cross tube from damage during installation and removal of the cargo basket.

1. Brush apply a thin coat of 3M-86A adhesion promoter on cross tube area to receive abrasion strip and allow to dry for 10 minutes.
2. Apply abrasion strip 427-015-001-131, or equivalent polyurethane protective strip (3M 8663) as applicable.

25-8 HANDLE BRACKET REPLACEMENT

Refer to Figure 25.6

1. Remove two (2) AN3-11A Bolts, AN960-10 Washers and MS21044N3 Nuts from each Handle Bracket (84267-01). Remove handle brackets from basket hoops.

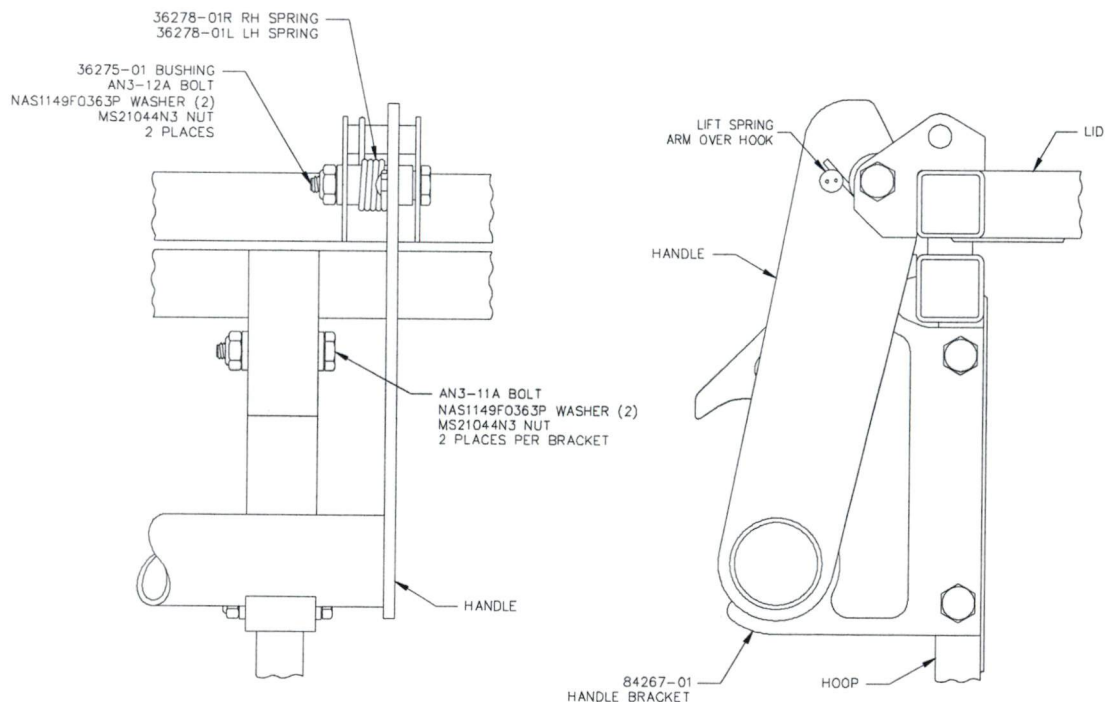


Figure 25.6 – Handle Bracket Parts

2. Slide two (2) replacement Handle Brackets (84267-01) onto basket hoops. Align Handle Bracket to bushings in hoop. Insert two (2) AN3-11A Bolts with AN960-10 Washers through Handle Bracket and bushing. Install AN960-10 Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2-3 N-m).

25-9 HANDLE SPRING REPLACEMENT

Refer to Figure 25.6.

1. Remove two (2) AN3-12A Bolts, NAS1149F0363P Washers (2) and MS21044N3 Nuts attaching handle to lid. Remove handle from basket. Remove springs from handle.
2. Slide replacement 36278-01R and 36278-01L Springs onto handle. Spring arm will catch on hook when on the correct side. Insert two 36275-01 bushings into handle attachments. Locate handle on basket, and insert two (2) AN3-12A Bolts with NAS1149F0363P Washers through bracket on lid and bushing in handle. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2-3 N-m). Lift spring arm over catch on handle and bar on lid bracket.

25-10 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove basket from mounting beams, refer to section 25-1.
2. At lower attachment keyway on aft beam, remove #10-32 stainless steel countersunk screw, 95931-10 Stop, and 69830-23 Spring. Discard defective spring.
3. Place 95931-10 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of aft beam. Thread screw into barrel nut inside lever arm. Torque screw to 20-25 in-lbs (2-3 N-m).

25-11 WEIGHT AND BALANCE

Multiple weight and balance configurations are required as the basket may be installed or removed in the field. The first is the mounting provisions only. The second is the configuration with the basket installed.

1. 95902 Mounting Provisions

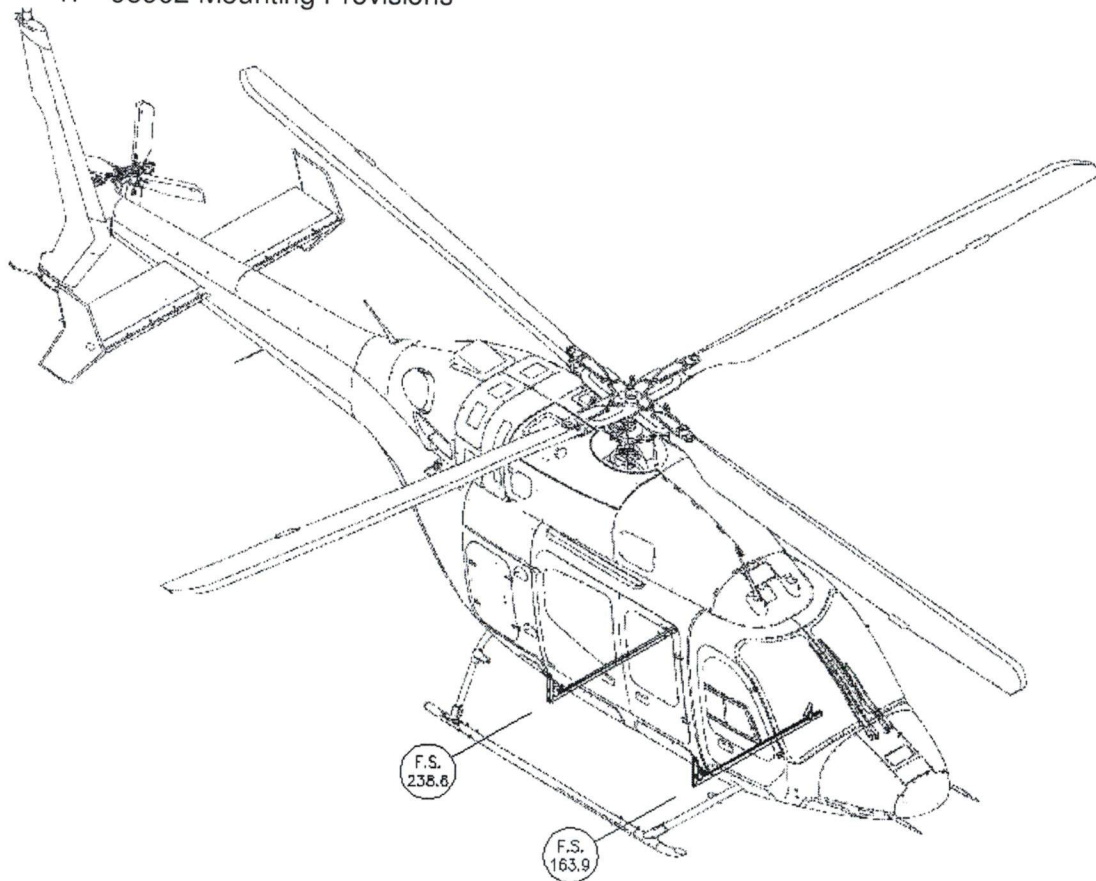


Figure 25.7 – Mounting Provisions Installation

| Part # | Standard Units Description | Weight (lbs) | Longitudinal | | Lateral | |
|-------------|--|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 95902-01-01 | RH Mounting Provisions Installation (Total) | 31.2 | 201.47 | 6286.01 | 2.91 | 90.85 |
| 95902-01-02 | LH Mounting Provisions Installation (Total) | 31.2 | 201.47 | 6286.01 | -2.91 | -90.85 |
| | | | | | | |
| | Metric Units | (kg) | (mm) | (mm-kg) | (mm) | (mm-kg) |
| 95902-01-01 | RH Mounting Provisions Installation (Total) | 14.15 | 5117.46 | 72422.75 | 73.96 | 1046.73 |
| 95902-01-02 | LH Mounting Provisions Installation (Total) | 14.15 | 5117.46 | 72422.75 | -73.96 | 1046.73 |

2. 95901 Quick Release Cargo Basket Installation

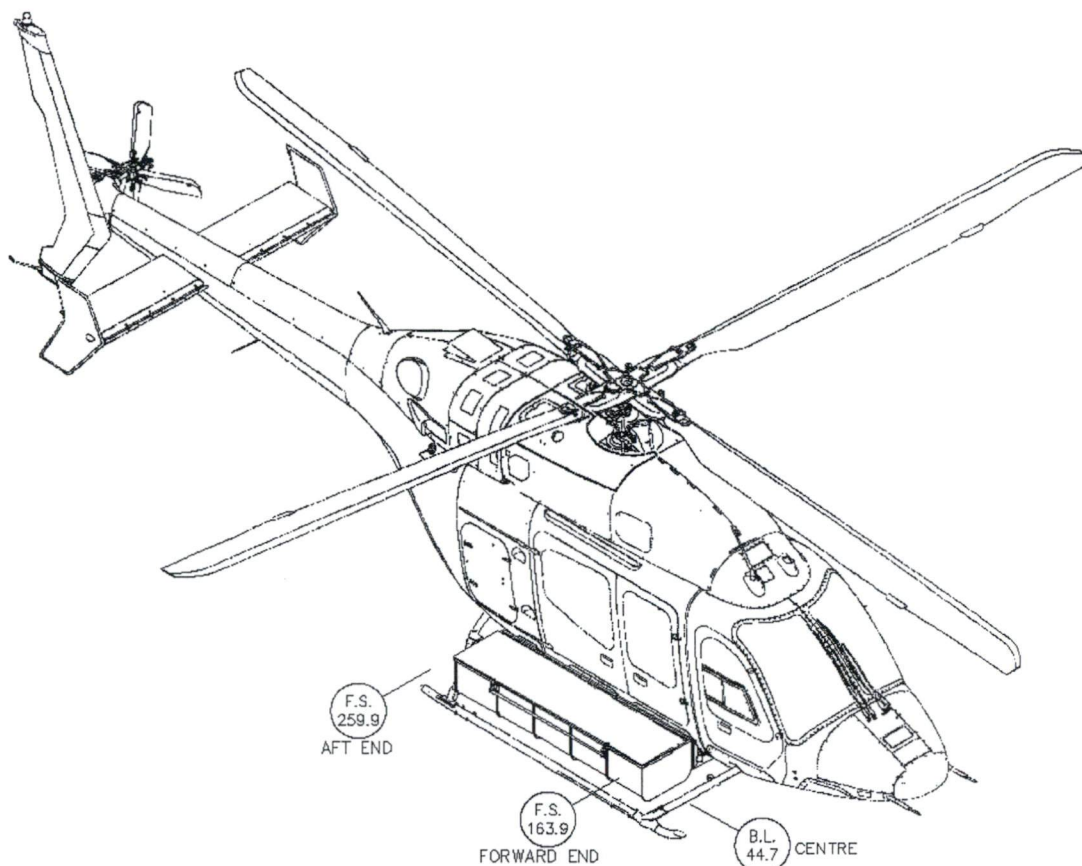


Figure 25.8 – Cargo Basket Installation

| Part # | Standard Units Description | Weight (lbs) | Longitudinal | | Lateral | |
|--------------|---|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 95910-01-01 | RH Cargo Basket | 71.2 | 211.86 | 15084.43 | 44.70 | 3182.64 |
| 95901-01-01 | RH Quick Release Cargo Basket Installation (Total) | 102.4 | 208.70 | 21370.44 | 31.97 | 3273.49 |
| 95910-01-02 | LH Cargo Basket | 71.2 | 211.86 | 15084.43 | -44.70 | -3182.64 |
| 95901-01-02 | LH Quick Release Cargo Basket Installation (Total) | 102.4 | 208.70 | 21370.44 | -31.97 | -3273.49 |
| Metric Units | | (kg) | (mm) | (mm-kg) | (mm) | (mm-kg) |
| 95910-01-01 | RH Cargo Basket | 32.30 | 5381.24 | 173791.66 | 1135.38 | 36668.02 |
| 95901-01-01 | RH Quick Release Cargo Basket Installation (Total) | 46.45 | 5300.87 | 246214.42 | 811.98 | 37714.75 |
| 95910-01-02 | LH Cargo Basket | 32.30 | 5381.24 | 173791.66 | -1135.38 | -36668.02 |
| 95901-01-02 | LH Quick Release Cargo Basket Installation (Total) | 46.45 | 5300.87 | 246214.42 | -811.98 | -37714.75 |

Cargo Basket Options – Standard Units

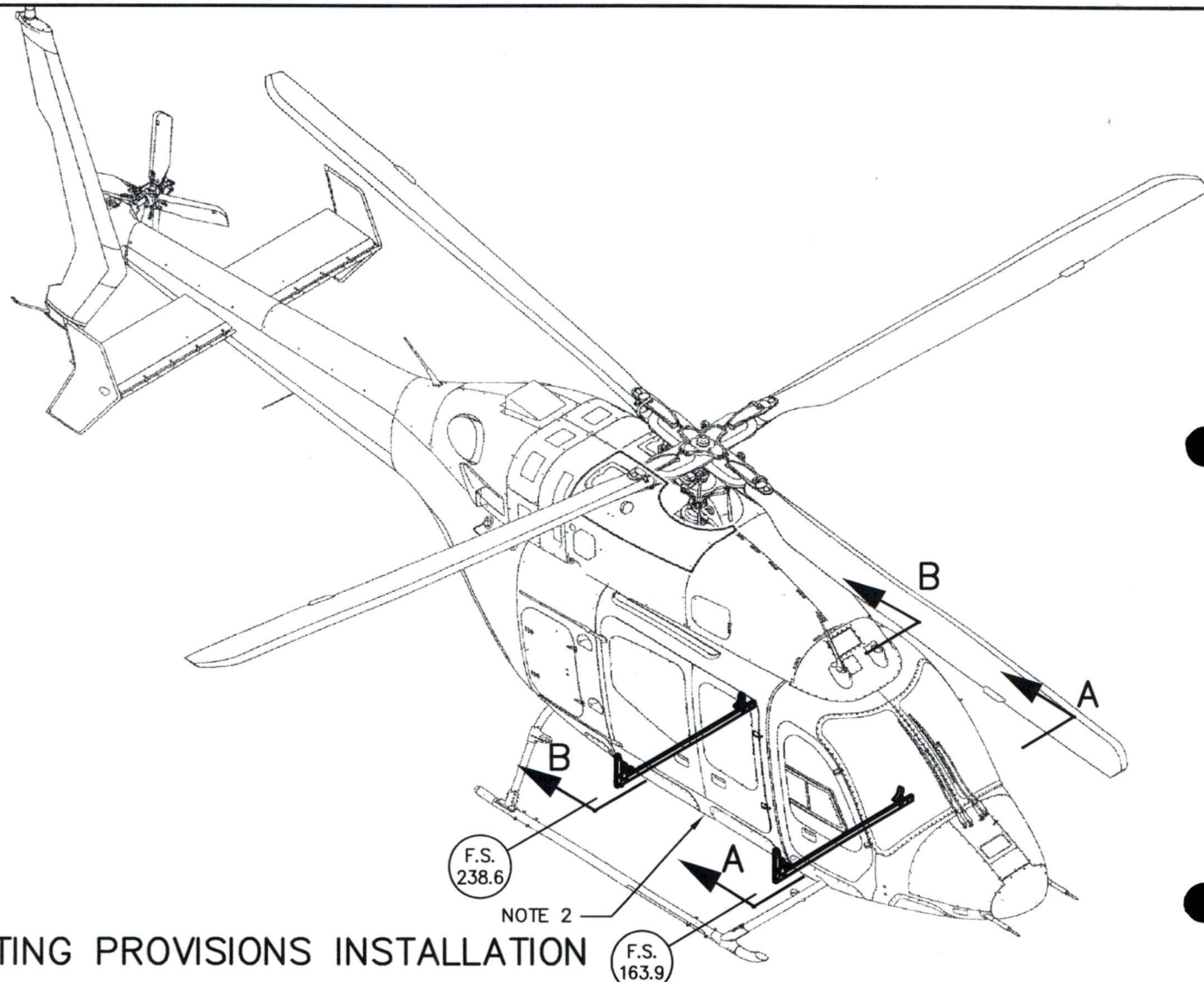
| Part # | Description | Weight (lbs) | Longitudinal | | Lateral | |
|----------|------------------------|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 70408-01 | Hangar Wheel (Aft End) | 0.8 | 257.50 | 206.00 | 44.70 | 35.76 |

Cargo Basket Options – Metric Units

| Part # | Description | Weight (lbs) | Longitudinal | | Lateral | |
|----------|------------------------|-----------------|--------------|--------------------|-------------|--------------------|
| | | | Arm (in) | Moment (in-lbs) | Arm (in) | Moment (in-lbs) |
| 70408-01 | Hangar Wheel (Aft End) | 0.36 | 6540.50 | 2354.58 | 1135.38 | 412.00 |

25-12 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

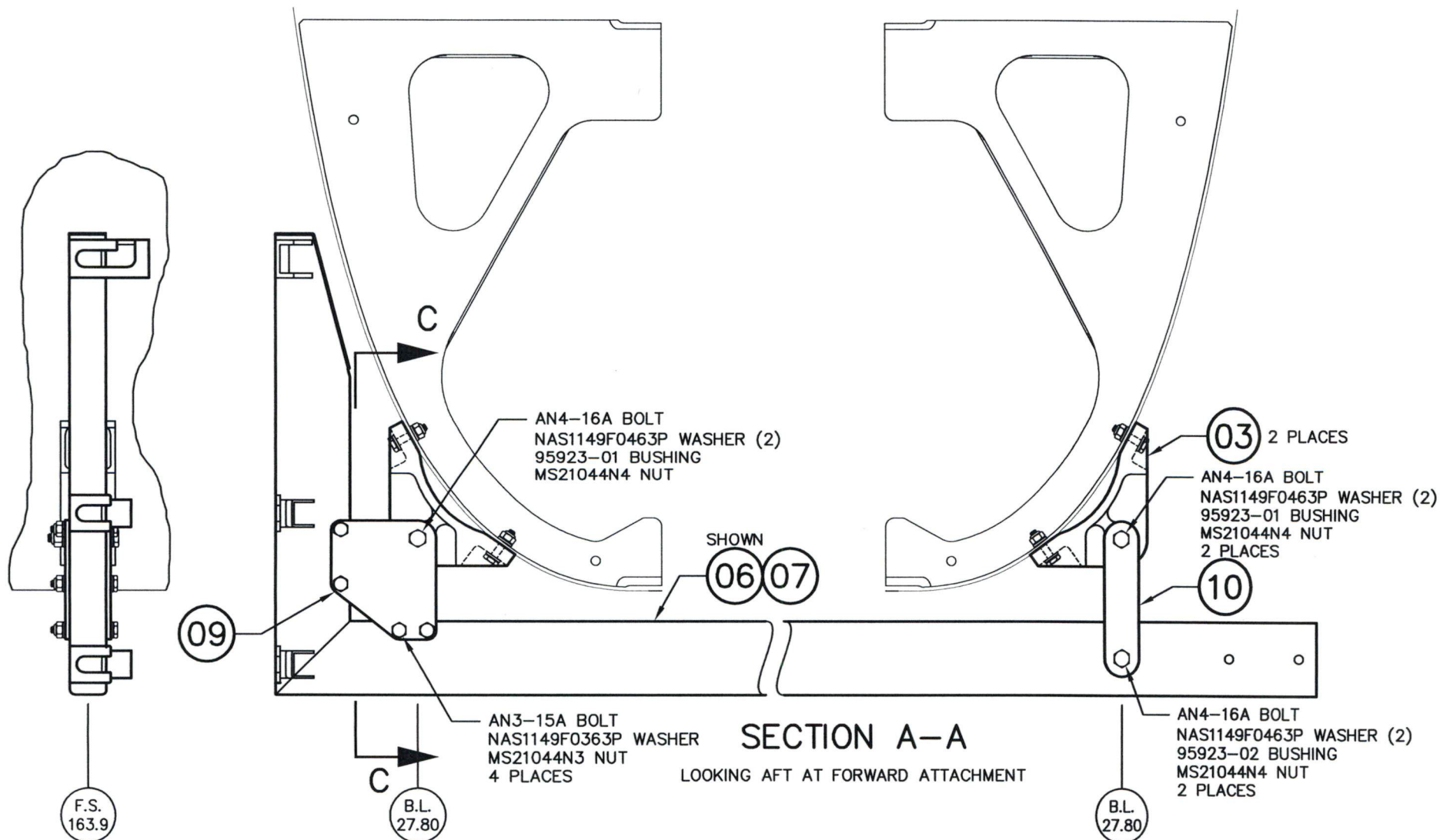


① RH MOUNTING PROVISIONS INSTALLATION

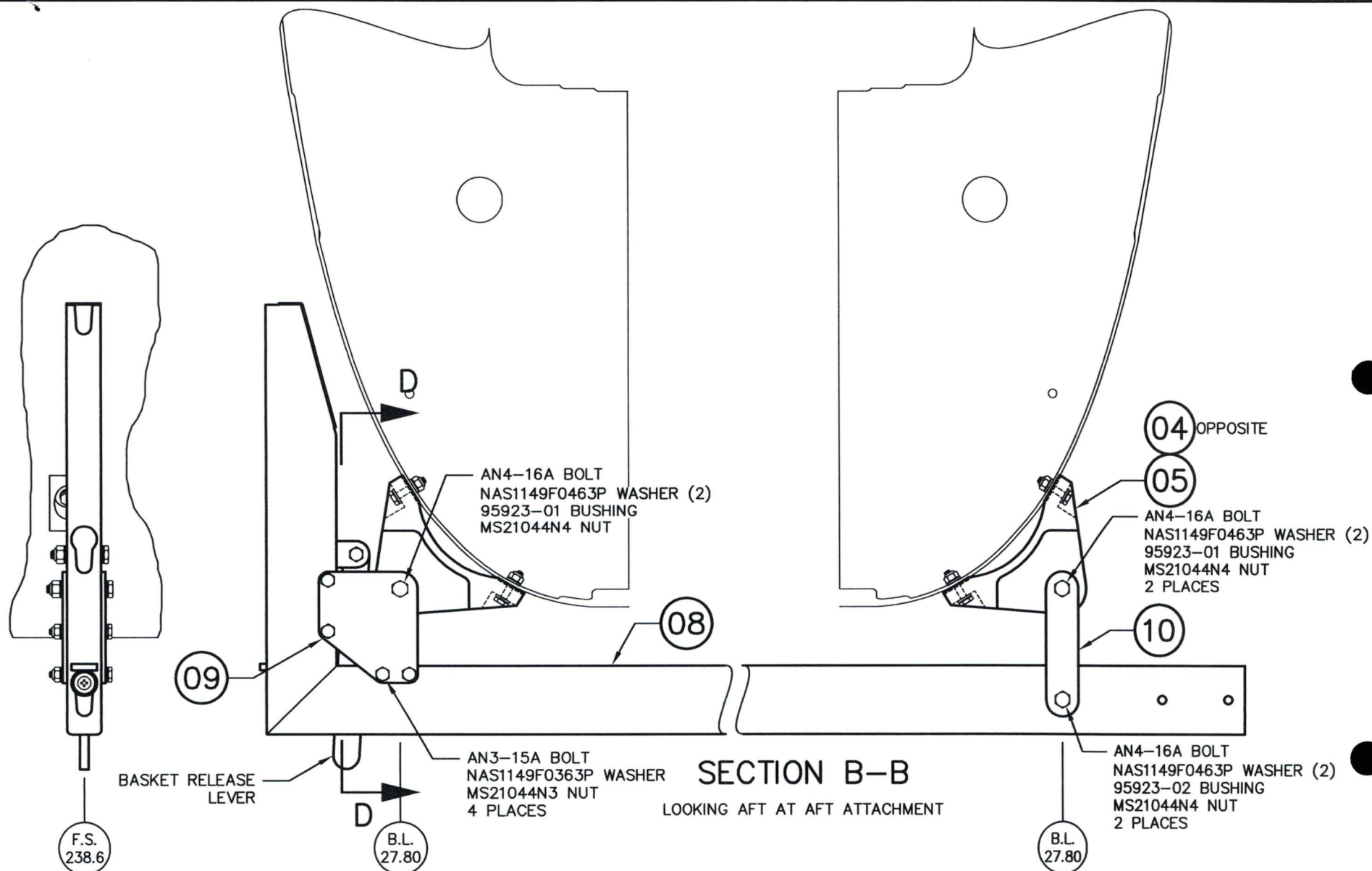
② LH MOUNTING PROVISIONS INSTALLATION

RIGHT HAND SHOWN, LEFT HAND OPPOSITE

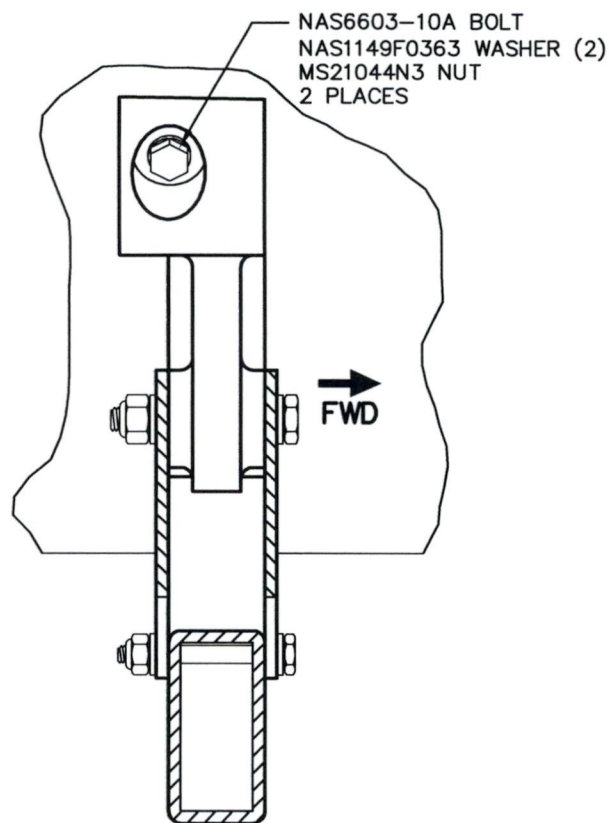
| | | | | | |
|--|--|-----------------|--|---|--|
| APPROVALS | | DATE | | AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca | |
| DRAWN: JEFF CLARKE | | 26 SEPT 2012 | | | |
| CHECKED: E. BURGOIN | | | | | |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1 | | | | BELL 429 QUICK RELEASE CARGO BASKET MOUNTING PROVISIONS INSTALLATION | |
| NOT TO SCALE | | | | | |
| SHEET 1 OF 5 | | DWG. SIZE A4 | | | |
| | | | | REV. 0 | |



| | | | | | | | |
|---|--|--------------|--|--|--|------|--|
| APPROVALS | | DATE | | <div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M</div> <div>2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7</div> <div>tel: (403) 260-6087 fax: (403) 260-8333 www.aerodesign.ca</div> | | | |
| DRAWN: JEFF CLARKE | | 26 SEPT 2012 | | | | | |
| CHECKED: E. BURGAIN | | | | | | | |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: | | | | <div>BELL 429</div> <div>QUICK RELEASE CARGO BASKET</div> <div>MOUNTING PROVISIONS INSTALLATION</div> | | | |
| DECIMALS | | ANGLES | | | | | |
| X.XXX ±0.010 | | ±1/2° | | | | | |
| X.XX ±0.03 | | | | | | | |
| X.X ±0.1 | | | | | | | |
| SCALE 1 : 4 | | DWG. SIZE | | DWG. NO. | | REV. | |
| SHEET 2 OF 5 | | A4 | | 95902 | | 0 | |

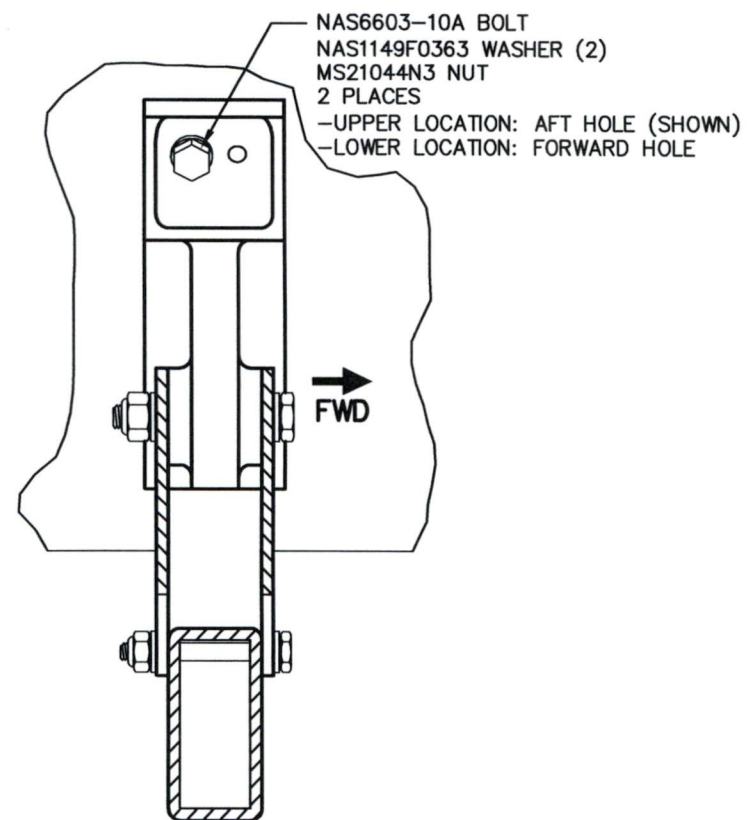


| | | | | | | | |
|---|--|--------------|--|--|--|----------|------|
| APPROVALS | | DATE | | <div>AERO DESIGN LTD.</div> <div>CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8027 fax: (403) 250-6333 www.aerodesign.ca</div> | | | |
| DRAWN: JEFF CLARKE | | 26 SEPT 2012 | | | | | |
| CHECKED: E. BURGOIN | | | | | | | |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: | | | | <div>BELL 429</div> <div>QUICK RELEASE CARGO BASKET MOUNTING PROVISIONS INSTALLATION</div> | | | |
| DECIMALS | | ANGLES | | | | | |
| X.XXX ±0.010 | | ±1/2" | | <div>SCALE 1 : 4</div> <div>SHEET 3 OF 5</div> | | | |
| X.XX ±0.03 | | | | | | | |
| X.X ±0.1 | | | | | | | |
| | | | | DWG. SIZE | | DWG. NO. | REV. |
| | | | | A4 | | 95902 | 0 |



SECTION D-D

LOOKING INBOARD AT AFT ATTACHMENT



SECTION C-C

LOOKING INBOARD AT FORWARD ATTACHMENT

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| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ± 0.010 $\pm 1/2^\circ$ X.XX ± 0.03 X.X ± 0.1 | | | BELL 429 QUICK RELEASE CARGO BASKET MOUNTING PROVISIONS INSTALLATION | | |
| SCALE 1 : 2 | | DWG. SIZE | DWG. NO. | REV. | |
| SHEET 4 OF 5 | | A4 | 95902 | 0 | |

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NOTES

- CABIN STEP MUST BE REMOVED FROM BOTH SIDES PRIOR TO THIS INSTALLATION.
REFER TO MAINTENANCE MANUAL BHT-429-MM-1, SECTION 32-57. REMOVE ANY REMAINING SEALANT ON SKIN.
- PLUG 4 HOLES IN FUSELAGE FOR CENTRE STEP SUPPORT WITH AN3-4A BOLT,
NAS1149F0363P WASHER (2) AND MS21044N3 NUT.
- TORQUE 3/16" FASTENERS TO 20-25 INCH-POUNDS.
TORQUE 1/4" FASTENERS TO 50-70 INCH-POUNDS.
- WEIGHT AND BALANCE GIVEN FOR RIGHT SIDE INSTALLATION.
LATERAL ARMS FOR LEFT SIDE ARE OPPOSITE.

WEIGHT AND BALANCE – METRIC

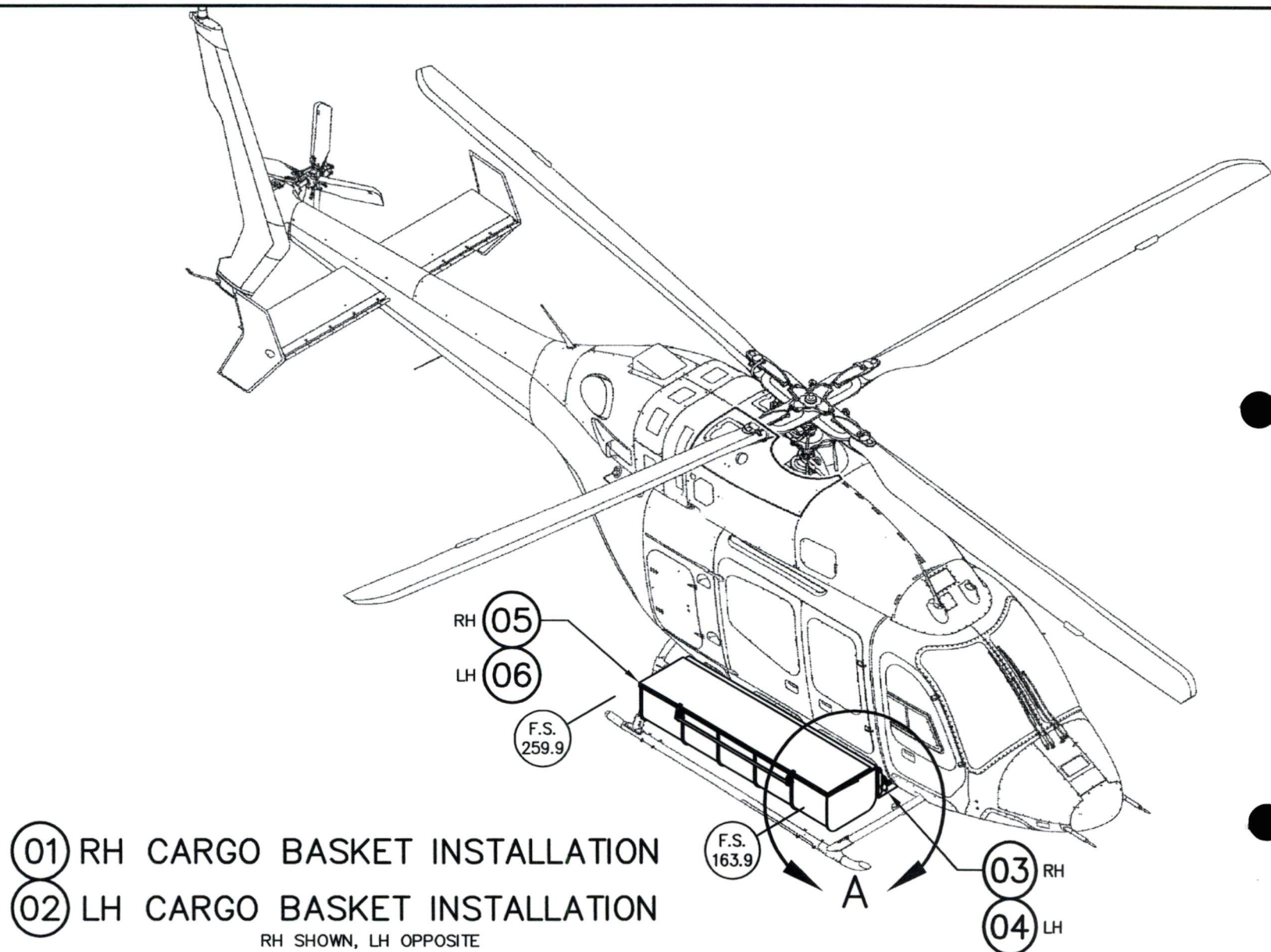
| ITEM | DESCRIPTION | WEIGHT (kg) | LONGITUDINAL | | LATERAL (NOTE 4) | |
|-------|---------------------------------|----------------|--------------|-------------------|------------------|-------------------|
| | | | ARM (mm) | MOMENT (mm-kg) | ARM (mm) | MOMENT (mm-kg) |
| 03 | FORWARD FITTING (PAIR) | 0.27 | 4162.0 | 1133 | 0 | 0 |
| 04/05 | AFT FITTING (PAIR) | 0.36 | 6060.7 | 2199 | 0 | 0 |
| 06/07 | FORWARD BEAM | 6.62 | 4162.0 | 27563 | 70.9 | 469 |
| 08 | AFT BEAM | 6.62 | 6060.7 | 40137 | 77.0 | 510 |
| 09 | PLATE (4) | 0.18 | 5111.5 | 927 | 726.4 | 132 |
| 10 | PLATE (4) | 0.09 | 5111.5 | 464 | -706.1 | -64 |
| 01/02 | PROVISIONS INSTALLATION (TOTAL) | 14.15 | 5117.5 | 72423 | 74.0 | 1047 |

WEIGHT AND BALANCE – STANDARD

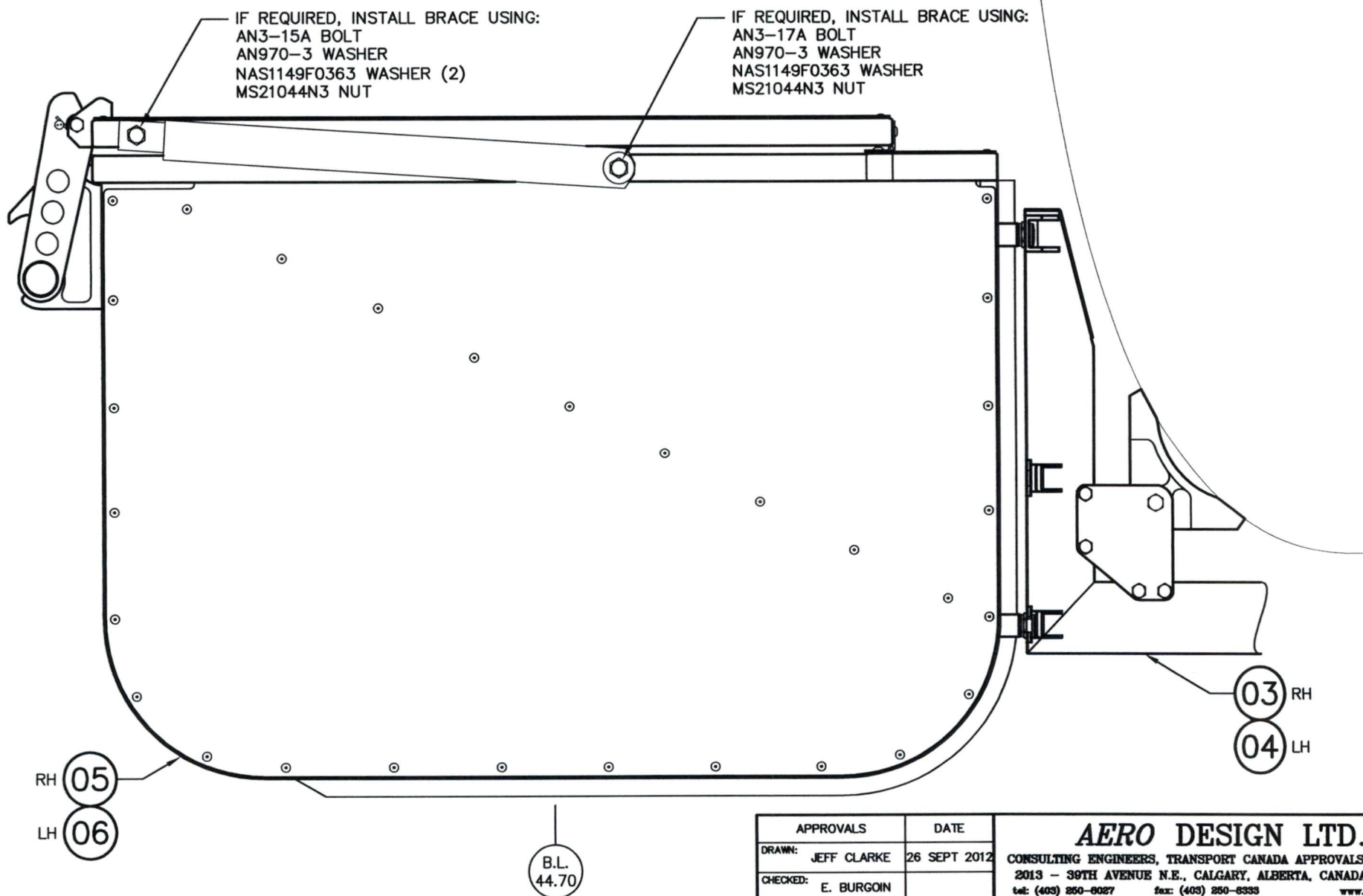
| ITEM | DESCRIPTION | WEIGHT (LB) | LONGITUDINAL | | LATERAL (NOTE 4) | |
|-------|---------------------------------|----------------|--------------|-------------------|------------------|-------------------|
| | | | ARM (IN) | MOMENT (LB-IN) | ARM (IN) | MOMENT (LB-IN) |
| 03 | FORWARD FITTING (PAIR) | 0.6 | 163.86 | 98.32 | 0 | 0 |
| 04/05 | AFT FITTING (PAIR) | 0.8 | 238.61 | 190.89 | 0 | 0 |
| 06/07 | FORWARD BEAM | 14.6 | 163.86 | 2392.36 | 2.79 | 40.73 |
| 08 | AFT BEAM | 14.6 | 238.61 | 3483.71 | 3.03 | 44.24 |
| 09 | PLATE (4) | 0.4 | 201.24 | 80.50 | 28.60 | 11.44 |
| 10 | PLATE (4) | 0.2 | 201.24 | 40.25 | -27.80 | -5.56 |
| 01/02 | PROVISIONS INSTALLATION (TOTAL) | 31.2 | 201.47 | 6286.01 | 2.91 | 90.85 |

| | | | |
|-----|-----|-------------------|--|
| 6 | 6 | MS21044N4 | NUT |
| 12 | 12 | NAS1149F0463P | WASHER |
| 6 | 6 | AN4-16A | BOLT |
| 20 | 20 | MS21044N3 | NUT |
| 40 | 40 | NAS1149F0363P | WASHER |
| 4 | 4 | AN3-4A | BOLT |
| 8 | 8 | AN3-15A | BOLT |
| 8 | 8 | NAS6603-10 | BOLT |
| 2 | 2 | 95923-02 | 12 BUSHING |
| 4 | 4 | 95923-01 | 11 BUSHING |
| 4 | 4 | 95922-02 | 10 PLATE |
| 4 | 4 | 95922-01 | 09 PLATE |
| 1 | 1 | 95931-01 | 08 AFT BEAM |
| 1 | | 95930-01-02 | 07 LH FORWARD BEAM |
| | 1 | 95930-01-01 | 06 RH FORWARD BEAM |
| 1 | 1 | 95921-02 | 05 AFT LH FITTING |
| 1 | 1 | 95921-01 | 04 AFT RH FITTING |
| 2 | 2 | 95920-01 | 03 FORWARD FITTING |
| | | 95902-01-02 | 02 LH MOUNTING PROVISIONS INSTALLATION |
| | | 95902-01-01 | 01 RH MOUNTING PROVISIONS INSTALLATION |
| 02 | 01 | PART NO. | ITEM DESCRIPTION |
| QTY | QTY | LIST OF MATERIALS | |

| | | | | |
|---|--|--------------|--|------|
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| NOT TO SCALE | | DWG. SIZE | DWG. NO. | REV. |
| SHEET 5 OF 5 | | A4 | 95902 | 0 |



| | | | | | |
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| CHECKED: E. BURGAIN | | | | | |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2* X.XX ±0.03 X.X ±0.1 | | | | BELL 429 QUICK RELEASE CARGO BASKET CARGO BASKET INSTALLATION | |
| NOT TO SCALE | | DWG. SIZE | DWG. NO. | | REV. |
| SHEET 1 OF 3 | | A4 | 95901 | | 0 |



DETAIL A

SCALE 1 : 4
LOOKING AFT AT FORWARD ATTACHMENT
AFT ATTACHMENT SIMILAR

| | | | | |
|---|--|--|--------------|----------|
| APPROVALS | | DATE | | |
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| CHECKED: E. BURGAIN | | | | |
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| DECIMALS ANGLES | | | | |
| X.XXX ±0.010 ±1/2° | | | | |
| X.XX ±0.03 | | | | |
| X.X ±0.1 | | BELL 429 QUICK RELEASE CARGO BASKET CARGO BASKET INSTALLATION | | |
| SCALE 1 : 4 | | DWG. SIZE | DWG. NO. | REV. |
| SHEET 2 OF 3 | | A4 | 95901 | 0 |

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|------|-----------------------|----------|------|
| 0 | INITIAL ISSUE | * | * |

NOTES

1. INSTALLATION OF MOUNTING PROVISIONS IN ACCORDANCE WITH DRAWING 95902 IS REQUIRED PRIOR TO THIS INSTALLATION.
2. REFER TO FLIGHT MANUAL SUPPLEMENT FMS959.90 FOR FLIGHT LIMITATIONS AND INFORMATION.
3. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA959.91 FOR MAINTENANCE INFORMATION.
4. BASKET INSTALLATION INSTRUCTIONS:
 - A) HOOK UPPER FORWARD ATTACHMENT INTO UPPER KEYWAY IN FORWARD MOUNTING BEAM.
 - B) LIFT BASKET FROM AFT END, SLIDE LOWER FORWARD ATTACHMENT INTO KEYWAY AND PULL BASKET AFT.
 - C) LIFT BASKET TO AFT MOUNTING BEAM, ENGAGE AFT ATTACHMENTS INTO KEYWAYS IN AFT BEAM.
 - D) PUSH BASKET DOWN TO LOCK BASKET INTO AFT BEAM, PIN WILL SPRING INTO PLACE WITH A SNAP.
 - E) CHECK THAT BASKET IS LOCKED IN PLACE BY ATTEMPTING TO LIFT AFT END OF BASKET.
5. WEIGHT AND BALANCE GIVEN FOR RIGHT SIDE, LATERAL ARMS FOR LEFT SIDE ARE NEGATIVE.

WEIGHT AND BALANCE – METRIC

| ITEM | DESCRIPTION | WEIGHT (kg) | LONGITUDINAL | | LATERAL (NOTE 5) | |
|-------|---------------------------|----------------|--------------|-------------------|------------------|-------------------|
| | | | ARM (mm) | MOMENT (mm–kg) | ARM (mm) | MOMENT (mm–kg) |
| 03/04 | PROVISIONS INSTALLATION | 14.15 | 5117.5 | 72423 | 74.0 | 1047 |
| 05/06 | CARGO BASKET ASSEMBLY | 32.30 | 5381.2 | 173792 | 1135.4 | 36668 |
| 01/02 | CARGO BASKET INSTALLATION | 46.45 | 5300.9 | 246214 | 823.6 | 37715 |
| | CARGO (MAXIMUM, CENTERED) | 136.08 | 5381.2 | 732268 | 1135.4 | 154500 |

WEIGHT AND BALANCE – STANDARD

| ITEM | DESCRIPTION | WEIGHT (LB) | LONGITUDINAL | | LATERAL (NOTE 5) | |
|-------|---------------------------|----------------|--------------|-------------------|------------------|-------------------|
| | | | ARM (IN) | MOMENT (LB–IN) | ARM (IN) | MOMENT (LB–IN) |
| 03/04 | PROVISIONS INSTALLATION | 31.2 | 201.47 | 6286.01 | 2.91 | 90.85 |
| 05/06 | CARGO BASKET ASSEMBLY | 71.2 | 211.86 | 15084.43 | 44.70 | 3182.64 |
| 01/02 | CARGO BASKET INSTALLATION | 102.4 | 208.70 | 21370.44 | 31.97 | 3273.49 |
| | CARGO (MAXIMUM, CENTERED) | 300.0 | 211.86 | 63558.00 | 44.70 | 13410.00 |

| | | | | |
|-----|-----|-------------------|------|-------------------------------------|
| 1 | | 95910-01-02 | 06 | LH CARGO BASKET ASSEMBLY |
| | 1 | 95910-01-01 | 05 | RH CARGO BASKET ASSEMBLY |
| 1 | | 95902-01-02 | 04 | LH MOUNTING PROVISIONS INSTALLATION |
| | 1 | 95902-01-01 | 03 | RH MOUNTING PROVISIONS INSTALLATION |
| | | 95901-01-02 | 02 | LH CARGO BASKET INSTALLATION |
| | | 95901-01-01 | 01 | RH CARGO BASKET INSTALLATION |
| 02 | 01 | PART NO. | ITEM | DESCRIPTION |
| QTY | QTY | LIST OF MATERIALS | | |

| APPROVALS | DATE |
|---------------------|--------------|
| DRAWN: JEFF CLARKE | 26 SEPT 2012 |
| CHECKED: E. BURGOIN | 10 NOV 2012 |

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

AERO DESIGN LTD.

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tel: (403) 250-8087 fax: (403) 250-8333 www.aerodesign.ca

BELL 429

QUICK RELEASE CARGO BASKET CARGO BASKET INSTALLATION

| NOT TO SCALE | DWG. SIZE | DWG. NO. | REV. |
|--------------|-----------|----------|------|
| SHEET 3 OF 3 | A4 | 95901 | 0 |

BY O. AssimCHECKED W. Faessler

Bell Helicopter
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REPORT FORM

MODEL 429 PAGE 1.1RPT. Cargo Basket

1 Cargo Basket

1.1 Analysis

429-030-471-101/102

Loads

The loads are provided by the customer who has the responsibility of developing those loads.
Ultimate drag load is 817 lbf (Ultimate)

Load Summary

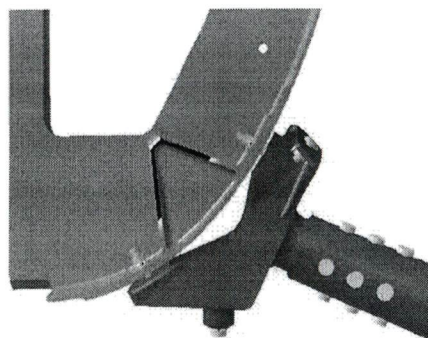
| Max. Cargo | Forward | Reactions | Aft | Reactions |
|------------|----------------|--------------|----------------|--------------|
| | FS | 163.8 | FS | 238.6 |
| | LBL -27.8 | RBL 27.8 | LBL -27.8 | RBL 27.8 |
| (lbs.) | Down (lbs.) | Up (lbs.) | Down (lbs.) | Up (lbs.) |
| 300 | 270 | 1325 | 352 | 1676 |
| 250 | 230 | 1153 | 301 | 1456 |
| 200 | 190 | 981 | 250 | 1236 |

Assumption

We assume the PAX steps were removed and their attachments were used as fixation points for the cargo basket.

Initial configuration

The PAX steps are attached to the frames (at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) through a step fitting that attach to the frames using 2 fasteners.



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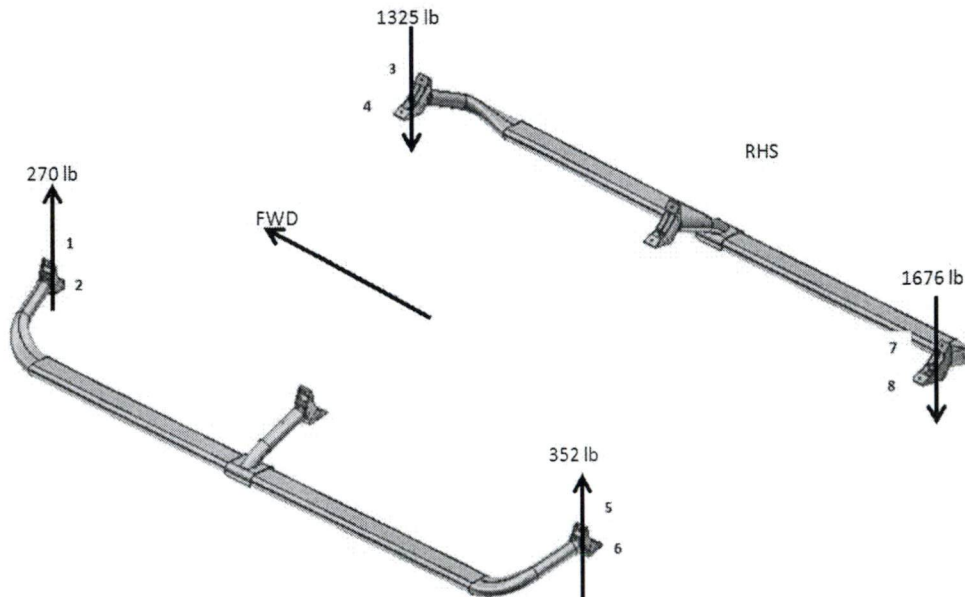
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 MODEL 429 PAGE 1.2
 RPT. Cargo Basket

429-030-471-101/102



| Fastener | x | y | z |
|----------|------------|------------|----------|
| 1 | 164.099487 | -28.109257 | 11.45468 |
| 2 | 163.61554 | -25.624069 | 8.356253 |
| 3 | 164.099487 | 28.109257 | 11.45468 |
| 4 | 163.61554 | 25.624069 | 8.356253 |
| 5 | 238.987701 | -27.599182 | 11.51144 |
| 6 | 238.543396 | -24.825966 | 8.514116 |
| 7 | 238.987701 | 27.599182 | 11.51144 |
| 8 | 238.543396 | 24.825966 | 8.514116 |

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RPT. Cargo Basket

Critical location: RHS AFT

[illegible]

| Group Properties | | Resultant loads about centroid | |
|--------------------|-------------------|--------------------------------|--|
| X_{xy} : 201.312 | I_x : 16.66 | F_x : 817.0 | |
| Y_{xy} : 26.540 | I_y : 5620.73 | F_y : 0.0 | |
| | I_z : 5618.79 | F_z : -3001.0 | |
| Y_{yz} : 26.540 | | M'_x : -3782.4 | |
| Z_{yz} : 9.959 | | M'_y : 12246.9 | |
| | I_{xy} : -47.78 | M'_z : -13652.4 | |
| X_{xz} : 201.312 | I_{yz} : 7.94 | | |
| Z_{xz} : 9.959 | I_{xz} : 9.45 | | |

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MODEL 429 PAGE 1.5
RPT. Cargo Basket

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

| | |
|------|------|
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |

| | | | | | |
|-----|-----|-----|----|-----|-----|
| max | 208 | 92 | 7 | 68 | 217 |
| min | 200 | -92 | -7 | -91 | 209 |

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| CHECKED <u>W. Faessler</u> | | RPT. <u>Cargo Basket</u> |

429-030-471-101/102

Initial configuration

Location: LHS we assume Drag load react on RHS

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

[illegible]

| | |
|------|------|
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |
| Ref. | Page |

| Group Properties | | | Resultant loads about centroid | | |
|------------------|---------|------------|--------------------------------|----------|---------|
| X_{xy} : | 201.312 | I_x : | 16.66 | F_x : | 0.0 |
| Y_{xy} : | -26.540 | I_y : | 5620.73 | F_y : | 0.0 |
| | | I_z : | 5618.79 | F_z : | 622.0 |
| Y_{yz} : | -26.540 | | | M'_x : | -784.0 |
| Z_{yz} : | 9.959 | | | M_y : | -3049.0 |
| | | I_{xy} : | 47.78 | M'_z : | 0.0 |
| X_{yz} : | 201.312 | I_{yz} : | -7.94 | | |
| Z_{xz} : | 9.959 | I_{xz} : | 9.45 | | |

[illegible]

| | | | | | |
|-----|----|-----|-----|-----|-----|
| max | 2 | 78 | 245 | 193 | 167 |
| min | -2 | -77 | 73 | 27 | 103 |

The shear LHS loads are lower than the shear RHS loads

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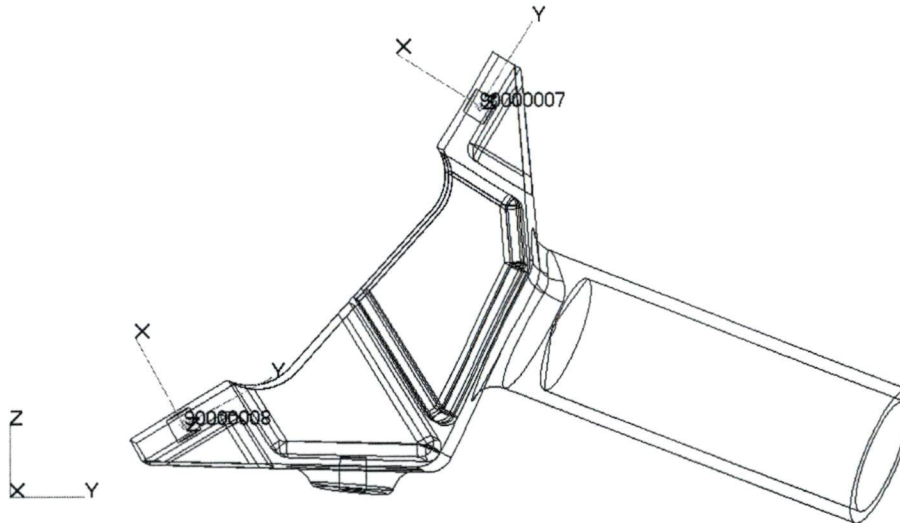
429-030-471-101/102

Max axial load is 922 lb at RHS FWD UPPER attachment (#3) occurs for Cargo Basket loads with drag loads
 Ref. page 4

Max compression axial load is 193 lb at LHS FWD UPPER attachment (#5)
 Ref. page 6

Max shear load is 864 lb at RHS AFT UPPER attachment (#7) occurs for Cargo Basket loads with drag loads
 Ref. page 4

Note: Patran was used to derive axial and shear loads at locations.



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| CHECKED <u>W. Faessler</u> | | RPT. <u>Cargo Basket</u> |

429-030-471-101/102

Initial configuration**Comparing Cargo basket loads to Design loads**

| | Design load | Reference | Cargo Basket load |
|-----------------|------------------------------|---|---------------------------------------|
| Max tension | 1908 lb tension ultimate | 429-030-400 / 4.26 429-030-471 Mid Lift Frame / 4.26.5 Passenger Step Interface | 922 lb Max tension Ultimate |
| Max compression | -978 lb compression Ultimate | 429-030-400 / 4.26 429-030-471 Mid Lift Frame / 4.26.5 Passenger Step Interface | -193 lb Max compression load Ultimate |
| Max Shear | 1512 lb shear ultimate | 429-030-400 / 4.26 429-030-471 Mid Lift Frame / 4.26.5 Passenger Step Interface | 864 lb Max shear load Ultimate |

Conclusion

Basket loads are less than original 429 step design loads

The critical location is the RHS, so the LHS is passed by inspection.

Therefore basket installation is structurally acceptable for the 429 airframe

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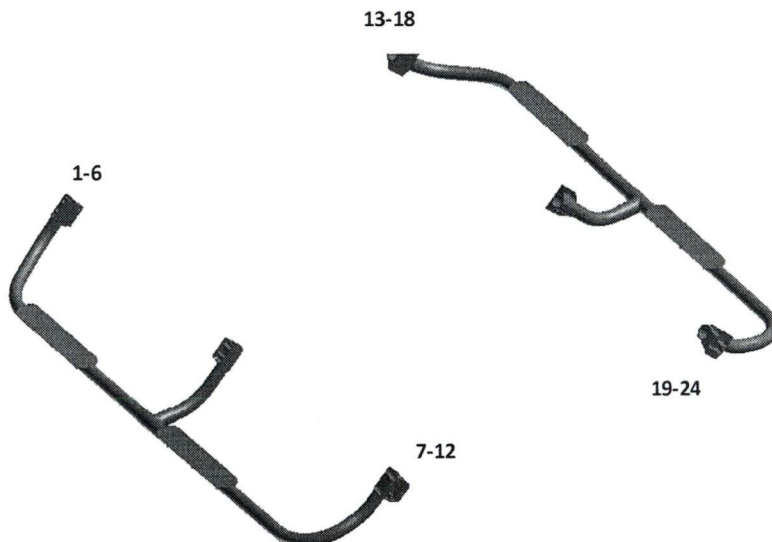
MODEL 429 PAGE 1.9
RPT. Cargo Basket

429-030-471-101/102

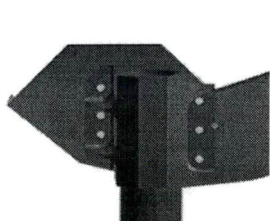
Weight and cost reduction configuration

The PAX step is attached directly to the frames
(at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) using 6 fasteners

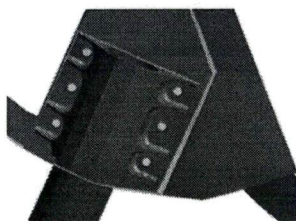
The critical location is the RHS, so the LHS is passed by inspection.



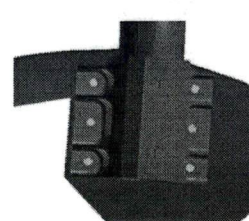
| Fastener | x | y | z |
|----------|---------|----------|---------|
| 1 | 163.339 | -22.8477 | 9.84343 |
| 2 | 163.228 | -23.5396 | 9.14344 |
| 3 | 163.117 | -24.2315 | 8.44345 |
| 4 | 163.615 | -24.6545 | 11.5856 |
| 5 | 163.504 | -25.3464 | 10.8856 |
| 6 | 163.393 | -26.0383 | 10.1856 |
| 7 | 239.186 | -22.46 | 10.0793 |
| 8 | 239.101 | -22.9909 | 9.54215 |
| 9 | 239.042 | -23.3578 | 9.17099 |
| 10 | 239.425 | -24.5814 | 11.5879 |
| 11 | 239.336 | -25.1367 | 11.0261 |
| 12 | 239.247 | -25.692 | 10.4643 |
| 13 | 163.339 | 22.8477 | 9.84343 |
| 14 | 163.228 | 23.5396 | 9.14344 |
| 15 | 163.117 | 24.2315 | 8.44345 |
| 16 | 163.615 | 24.6545 | 11.5856 |
| 17 | 163.504 | 25.3464 | 10.8856 |
| 18 | 163.393 | 26.0383 | 10.1856 |
| 19 | 239.186 | 22.46 | 10.0793 |
| 20 | 239.101 | 22.9909 | 9.54215 |
| 21 | 239.042 | 23.3578 | 9.17099 |
| 22 | 239.425 | 24.5814 | 11.5879 |
| 23 | 239.336 | 25.1367 | 11.0261 |
| 24 | 239.247 | 25.692 | 10.4643 |



Mid Lift Frame



MID Quarter Frame



FWD Quarter Frame

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MODEL 429 PAGE 1.10
RPT. Cargo Basket

429-030-471-101/102

Weight and cost reduction configuration - No drag load

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

[illegible]

| Group Properties | | Resultant loads about centroid | |
|--------------------|-------------------|--------------------------------|--|
| X_{xy} : 201.294 | I_x : 26.48 | F_x : 0.0 | |
| Y_{xy} : 24.240 | I_y : 17273.93 | F_y : 0.0 | |
| Y_{yz} : 24.240 | I_z : 17278.64 | F_z : -3001.0 | |
| Z_{yz} : 10.163 | | M_x : -10684.4 | |
| | I_{xy} : -91.49 | M_y : 13081.9 | |
| X_{xz} : 201.294 | I_{yz} : 6.10 | M_z : 0.0 | |
| Z_{xz} : 10.163 | I_{yz} : 69.33 | | |

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REPORT FORM

MODEL 429 PAGE 1.11

RPT. Cargo Basket

429-030-471-101/102

Weight and cost reduction configuration - with drag load

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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| Group Properties | | Resultant loads about centroid | |
|--------------------|-------------------|--------------------------------|--|
| X_{xy} : 201.294 | I_x : 26.48 | F_x : 817.0 | |
| Y_{xy} : 24.240 | I_y : 17273.93 | F_y : 0.0 | |
| Y_{yz} : 24.240 | I_z : 17278.64 | F_z : -3001.0 | |
| Z_{yz} : 10.163 | | M_x : -10684.4 | |
| | I_{cy} : -91.49 | M_y : 12131.6 | |
| X_{xz} : 201.294 | I_{yz} : 6.10 | M_z : -15531.4 | |
| Z_{xz} : 10.163 | I_{yz} : 69.33 | | |

[illegible]

| | | |
|-----|--------|-------|
| max | 73.3 | 972.1 |
| min | 62.9 | 365.1 |
| max | 975 lb | |

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MODEL 429 PAGE 1.12

RPT. Cargo Basket

429-030-471-101/102

Weight and cost reduction configuration - Empty basket

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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| Ref. | Page |
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| Group Properties | | Resultant loads about centroid | |
|--------------------|-------------------|--------------------------------|--|
| X_{xy} : 201.294 | I_x : 26.48 | F_x : 817.0 | |
| Y_{xy} : 24.240 | I_y : 17273.93 | F_y : 0.0 | |
| Y_{yz} : 24.240 | I_z : 17278.64 | F_z : 0.0 | |
| Z_{yz} : 10.163 | | M_x : 0.0 | |
| | b_{xy} : -91.49 | M_y : -950.3 | |
| X_{xz} : 201.294 | I_{yz} : 6.10 | M_z : -15531.4 | |
| Z_{xz} : 10.163 | b_{yz} : 69.33 | | |

[illegible]

| | | |
|-----|-------|------|
| max | 69.7 | 37.5 |
| min | 66.5 | 30.9 |
| max | 79 lb | |

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429-030-471-101/102

Comparing Cargo basket loads to Design loads

| | Design load | Reference | Cargo Basket load |
|-----------------|------------------|---|---|
| Max tension | 483 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 73.3 lb Max axial load Ultimate |
| Max Shear | 989 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 972 lb Max shear load Ultimate |
| Max compression | -421 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 73.3 lb Max axial load amplitude Ultimate |

Conclusion

Basket loads are less than original 429 step design loads
The critical location is the RHS, so the LHS is passed by inspection.
Therefore basket installation is structurally acceptable for the 429 airframe

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AERO Design Ltd.

ENGINEERING REPORT

ER959.01

BELL 429

QUICK RELEASE CARGO BASKET

Prepared by: Jeff Clarke, CET

Approved by: E. Burgoin, P.Eng., DAR 290M

Revision 0, 06 September 2012

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1.0 INTRODUCTION

This report is to demonstrate that the cargo basket installation for the Bell 429 complies with the basis of certification. Basket construction is the same as all other AERO Design Ltd. cargo baskets, with 4130 steel tubing hoops and rims, lined with expanded steel mesh. The mounting beams are stainless steel. The attachment to the helicopter uses the existing step attachment points on the fuselage, with a machined aluminum fitting to connect the beams to the fuselage.

2.0 REFERENCE TEXT

AERO Design Ltd. Reports ER959.02

AERO Design Ltd. Drawings 95910, 95911, 95912, 95920, 95921, 95930, 95931

3.0 BASIS OF CERTIFICATION

TCDS H-107:

Airworthiness Manual (AWM) Chapter 527 – *Normal Category Rotorcraft* at Change 527-6 published June 1, 2005 (equivalent to FAR part 27 at Amdt. 27-40), including Appendix B for IFR and Appendix C for Category A, plus

FAR Part 27, Amdt. 27-44, effective June 16, 2008 as adopted by reference

AWM Chapter 527 Appendix C – *Criteria for Category A* specifies certain sections of AWM Chapter 529 – *Transport Category Rotorcraft*. For these specified sections, AWM Chapter 529 at Change 529-6 published June 30, 2008 (equivalent to FAR Part 29 at Amdt. 29-45) is applicable, plus FAR 29.1587(a)(7) Amdt. 29-51, effective March 31, 2008 as adopted by reference.

This report demonstrates that the installation of the Quick Release Cargo Basket (945 configuration) complies with the original basis of certification.

4.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

There are currently no Airworthiness Directives applicable to the Bell 429.

5.0 LOADS

Quick Release Cargo Basket - Bell 429

CAR 527.561(d)

| | |
|--|----------------------|
| Ultimate Upward Emergency Landing Load Factor: | $n_{e_up} := 1.5$ |
| Ultimate Forward Emergency Landing Load Factor: | $n_{e_fwd} := 4.0$ |
| Ultimate Sideward Emergency Landing Load Factor: | $n_{e_side} := 2.0$ |
| Ultimate Downward Emergency Landing Load Factor: | $n_{e_down} := 4.0$ |

CAR 527.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

CAR 527.303 Safety Factor: $n_{sf} := 1.5$

CAR 527.337(a)

| | | |
|--|--|--------------------------|
| | Limit Positive Maneuvering Load Factor: | $n_{man} := 3.5$ |
| $n_{man_ult} := n_{man} \cdot n_{sf}$ | Ultimate Positive Maneuvering Load Factor: | $n_{man_ult} = 5.25$ |
| | Limit Negative Maneuvering Load Factor: | $n_{man_neg} := -1.0$ |
| $n_{man_neg_u} := n_{man_neg} \cdot n_{sf}$ | Ultimate Negative Maneuvering Load Factor: | $n_{man_neg_u} = -1.5$ |

CRITICAL ULTIMATE LOAD FACTORS:

| | | |
|-----------|--|-----------------------|
| Downward: | Ultimate Positive Maneuvering Load Factor: | $n_{man_ult} = 5.25$ |
| Forward: | Ultimate Forward Emergency Landing Load Factor: | $n_{e_fwd} = 4$ |
| Sideward: | Ultimate Sideward Emergency Landing Load Factor: | $n_{e_side} = 2$ |
| Upward: | Ultimate Upward Emergency Landing Load Factor: | $n_{e_up} = 1.5$ |

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.1 Inertia Loads

$W_{\text{basket}} := 70 \text{ lbf}$ Weight of basket (including options, basic basket is less)

$W_{\text{cargo}} := 300 \text{ lbf}$ Weight of cargo (max)

$W_{\text{beam}} := 14.6 \text{ lbf}$ Weight of mounting beam (each)

$$P_{\text{man_lim}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_lim}}$$

$P_{\text{man_lim}} = 1295 \text{ lbf}$ Limit maneuvering load due to cargo and basket

$$P_{\text{man_ult}} := P_{\text{man_lim}} \cdot n_{\text{sf}}$$

$P_{\text{man_ult}} = 1943 \text{ lbf}$ Ultimate maneuvering load due to cargo and basket

$$P_{\text{man_lim_neg}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_neg}}$$

$P_{\text{man_lim_neg}} = -370 \text{ lbf}$ Limit negative maneuvering load due to cargo and basket

$$P_{\text{man_ult_neg}} := P_{\text{man_lim_neg}} \cdot n_{\text{sf}}$$

$P_{\text{man_ult_neg}} = -555 \text{ lbf}$ Ultimate negative maneuvering load due to cargo and basket

The negative maneuvering load factor is more critical than the upward emergency landing condition because it is combined with the drag load.

5.2 Drag Load

$l_{\text{basket}} := 96.5 \text{ in}$ Length of basket.

$w_{\text{basket}} := 25.5 \text{ in}$ Width of basket.

$h_{\text{basket}} := 18.5 \text{ in}$ Height of basket.

$A_f := 455 \text{ in}^2$ Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$A_p = 2461 \text{ in}^2$ Planar Area of basket.

$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.8$ Fineness ratio of basket

| | |
|---|---|
| $C_{Do} := 1.1$ | Drag Coefficient of Basket, (overestimated) (Ref. Hoerner, Fluid Dynamic Drag, Figure 22). |
| $\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$ | Density of air at Sea Level. |
| $V_{ne} := 155 \text{ knots}$ | Never-Exceed-Speed of Bell 429. (Ref. Bell 429 Flight Manual.) |
| $V_d := \frac{V_{ne}}{0.9}$ | |
| $V_d = 172 \text{ knots}$ | Design Dive Speed of Bell 429 |
| $P_{\text{drag_lim}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$ | |
| $P_{\text{drag_lim}} = 349 \text{ lbf}$ | Limit Drag load on basket. |
| $P_{\text{drag_ult}} := P_{\text{drag_lim}} \cdot n_{sf}$ | |
| $P_{\text{drag_ult}} = 524 \text{ lbf}$ | Ultimate Drag load on basket. |

5.3 Attachment Fitting Loads

The attachment of the mounting beams to the fittings prevents transfer of a bending moment to the fittings. The attachment on the side opposite to the basket cannot carry a lateral load. The fittings are substantiated by analysis, and therefore require the fitting factor (CAR 527.625) to be included.

Load Location Assumptions

- Load CofG is located at lateral centreline of cargo basket.
(BL 43.25 for standard basket, BL 44.75 for wide basket)
- Load CofG is located at longitudinal centreline of cargo basket.
(FS 201.25 for short cargo basket)
(FS 211.6 for long (8 ft.) cargo basket)

The aft beam is critical with the wide, long cargo basket inst'n because an extended length cargo basket will cantilever past the aft beam, and wide basket is further outboard from centreline (BL 44.75).

The forward beam is critical with the wide, short cargo basket inst'n because the short length cargo basket equally distributes load between forward and aft support beams and wide basket is further outboard from centreline (BL 44.75)

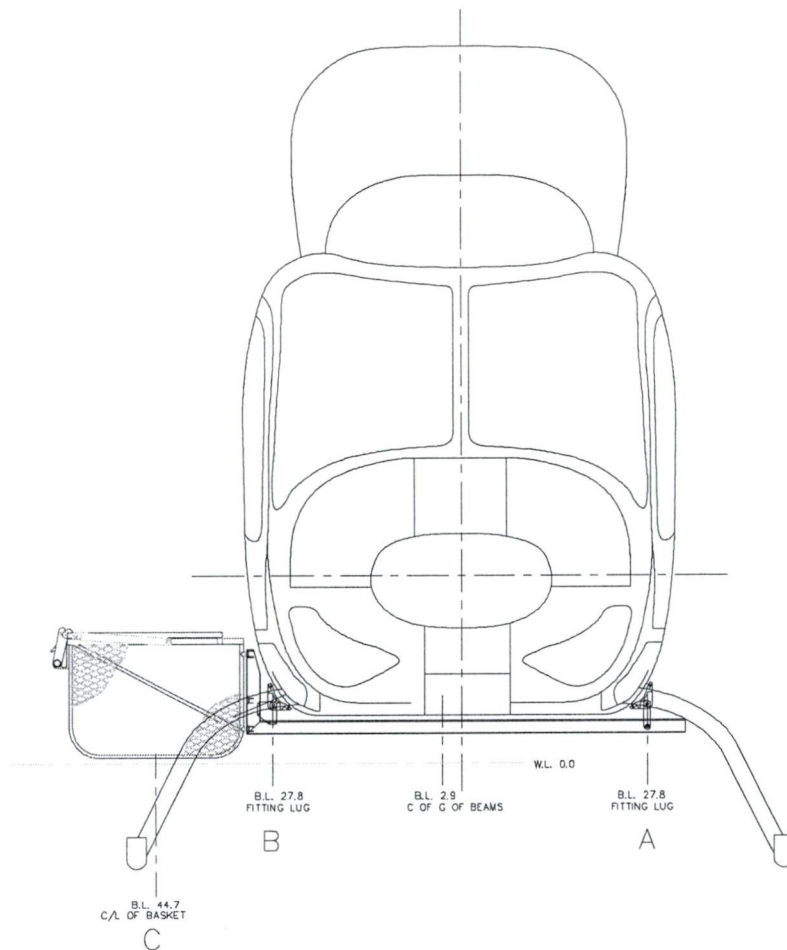


Figure 5.3.1 – Load Locations

AFT SUPPORT BEAM REACTIONS

Critical Load on Aft Support Beam applied at FS 238.6 and BL 44.7

Ult. Load on aft beam due to **LONG** basket, aft beam and max cargo load

Moments about FS 163.8

$$P_{ult_aft} := \frac{(W_{basket} + W_{cargo}) \cdot n_{man} \cdot n_{sf} \cdot n_{ff} (211.6 - 163.6)}{238.6 - 163.8}$$

$$P_{ult_aft} = 1433.5 \text{ lbf}$$

applied at FS238.6 and BL 44.7
for max cargo weight:

$$W_{cargo} = 300 \text{ lbf}$$

$$AC := 44.7 + 27.8$$

$$AB := 27.8 + 27.8$$

Ult. Reactions at helicopter step support
at point B

Moments about A (BL -27.8) for point B

$$R_{b_rear} := \frac{-P_{ult_aft} \cdot AC}{AB} - 0.65 (W_{beam} \cdot n_{man} \cdot n_{sf} \cdot n_{ff})$$

$$R_{b_rear} = -1926.9 \text{ lbf}$$

Assumes 65% of beam weight acts on
basket side fitting

Moments about B for point A

$$R_{a_rear} := \frac{P_{ult_aft} (44.7 - 27.8)}{27.8 + 27.8} - 0.35 (W_{beam} \cdot n_{man} \cdot n_{sf} \cdot n_{ff})$$

$$R_{a_rear} = 404.7 \text{ lbf}$$

Assumes 35% of beam weight acts on
basket opposite side fitting

FORWARD SUPPORT BEAM REACTIONS

Critical Load on Forward Support Beam applied at FS 163.8 and BL 44.7

Ult. Load on aft beam due to **SHORT** basket, aft beam and max cargo load
Moments about FS 238.6

$$P_{ult_fwd} := \frac{(W_{basket} + W_{cargo}) \cdot n_{man} \cdot n_{sf} \cdot n_{ff} (201.25 - 163.6)}{238.6 - 163.8}$$

$$P_{ult_fwd} = 1124.4 \text{ lbf}$$

applied at FS163.8 and BL 44.7

for max cargo weight: $W_{cargo} = 300 \text{ lbf}$

$$AC := 44.7 + 27.8$$

$$AB := 27.8 + 27.8$$

Ult. Reactions at helicopter step supports
at Point B

Moments about A (BL -27.8)

$$R_{b_fwd} := \frac{-P_{ult_fwd} \cdot AC}{AB} - 0.65 (W_{beam} \cdot n_{man} \cdot n_{sf} \cdot n_{ff})$$

$$R_{b_fwd} = -1523.9 \text{ lbf}$$

Assumes 65% of beam weight acts on
basket side fitting

Moments about B (BL 27.8)

$$R_{a_fwd} := \frac{P_{ult_fwd} (44.7 - 27.8)}{27.8 + 27.8} - 0.35 (W_{beam} \cdot n_{man} \cdot n_{sf} \cdot n_{ff})$$

$$R_{a_fwd} = 310.7 \text{ lbf}$$

Assumes 35% of beam weight acts on
basket opposite side fitting

Summary of Critical Loads

$$R_{a_fwd} = 310.7\text{lbF}$$

$$R_{b_fwd} = -1523.9\text{lbF}$$

$$R_{a_rear} = 404.7\text{lbF}$$

$$R_{b_rear} = -1926.9\text{lbF}$$

DRAG LOAD**SUPPORT BEAM REACTIONS**

Critical Load on Support Beam applied at FS 238.6 and BL 44.7

Ult. Load on beam due to drag

Assuming basket is rigid and load is shared equally between front and rear mounting beams

The loads are applied at the same locations as in Figure 5.3.1, but as viewed from the top.

$$AC := 44.7 + 27.8$$

$$AB := 27.8 + 27.8$$

Ult. Reactions at helicopter step support
at point B

Moments about A (BL -27.8) for point B

$$R_{b_drag} := \frac{P_{drag_ult} \cdot n_{ff} \cdot AC}{AB}$$

$$R_{b_drag} = 785.4\text{lbF} \quad \text{Ultimate drag reaction at B (forward)}$$

Moments about B for point A

$$R_{a_drag} := \frac{P_{drag_ult} \cdot n_{ff} \cdot (44.7 - 27.8)}{27.8 + 27.8}$$

$$R_{a_drag} = 183.1\text{lbF} \quad \text{Ultimate drag reaction at A (aft)}$$

6.0 STRUCTURAL COMPLIANCE

6.1 Cargo Basket and Mounting Beams

Structural compliance of the basket and mounting beams is demonstrated by test. Refer to ER959.02 for test report. The basket and mounting beams have been demonstrated to support the required loads for 300 lbs of cargo.

6.2 Attachment Fittings

The geometry of the attachment fittings is similar. The aft fitting is critical due to the higher load. The load is applied to the fitting through an AN4 bolt in double shear:

$$p_s := -R_{b_rear}$$

$$p_s = 1926.9\text{ lbf}$$

Ultimate shear applied to AN4 bolt

$$P_{su_AN4} := 3680\text{ lbf}$$

Ultimate single shear strength of AN4 Bolt
(ref: MIL-HDBK-5J)

$$MS := \left(\frac{2 \cdot P_{su_AN4}}{p_s} \right) - 1$$

$$MS = 2.8$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

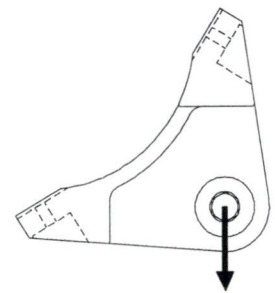


Figure 6.2.1 – Bolt

The bolt bears on a brass bushing. The bearing area of the bolt on the bushing is sufficiently large that it is not critical. The bushing bears on the lug of the fitting.

$$p_{br} := -R_{b_rear}$$

$$p_{br} = 1926.9\text{ lbf}$$

Ultimate bearing load on lug

$$A_{br} := 0.4375\text{ in} \cdot 1.0\text{ in}$$

$$A_{br} = 0.4375\text{ in}^2$$

Bearing area

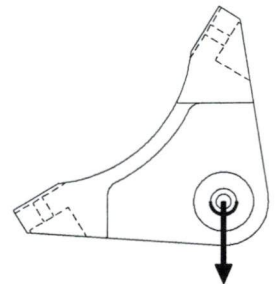


Figure 6.2.2 – Bearing

$$f_{br} := \frac{p_{br}}{A_{br}}$$

$$f_{br} = 4.4 \text{ ksi}$$

Ultimate bearing stress

$$F_{bru_6061} := 52 \text{ ksi}$$

Ultimate bearing strength of 6061-T6 aluminum
(ref: MIL-HDBK-5J, thickness over 1", E/D 1.5)

$$MS := \left(\frac{F_{bru_6061}}{f_{br}} \right) - 1$$

$$MS = 10.8$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

Tension on lug:

$$p_t := -R_{b_rear}$$

$$p_t = 1926.9 \text{ lbf}$$

Ultimate tension load on lug

$$A_t := 0.826 \text{ in}^2$$

Tension area through lug

$$f_t := \frac{p_t}{A_t}$$

$$f_t = 2332.8 \text{ psi}$$

Ultimate tensile stress on lug

$$F_{tu_6061} := 38 \text{ ksi}$$

Ultimate tensile strength of 6061-T6 aluminum
(ref: MIL-HDBK-5J)

$$MS := \left(\frac{F_{tu_6061}}{f_t} \right) - 1$$

$$MS = 15.3$$

Margin of Safety

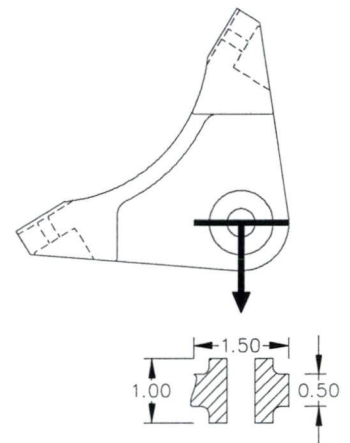
MARGIN OF SAFETY IS POSITIVE

Figure 6.2.3 – Tension

Shear tear-out on lug:

$$p_s := -R_{b_rear}$$

$$p_s = 1926.9 \text{ lbf}$$

$$A_s := 0.59 \text{ in}^2$$

$$A_s = 1.18 \text{ in}^2$$

$$f_s := \frac{p_s}{A_s}$$

$$f_s = 1633 \text{ psi}$$

$$F_{su_6061} := 19 \text{ ksi}$$

$$MS := \left(\frac{F_{su_6061}}{f_t} \right) - 1$$

$$MS = 7.1$$

Aft fittings, load on attaching bolts, using Bruhn section D1.17.

Shift load to centroid of bolt pattern, resulting in load and moment at centroid

$$M := -R_{b_rear} \cdot 1.696 \text{ in}$$

$$M = 3268 \text{ in} \cdot \text{lbf}$$

Load is now centered between the bolts, so the vertical load is shared equally

$$R_y := \frac{-R_{b_rear}}{2}$$

$$R_y = 963.5 \text{ lbf}$$

$$r := 2.028 \text{ in}$$

$$I := r^2 + r^2$$

$$I = 8.2 \text{ in}^2$$

$$F_m := \frac{(M \cdot r)}{I}$$

$$F_m = 805.7 \text{ lbf}$$

Ultimate shear tear-out load on lug

Shear tear-out area through lug

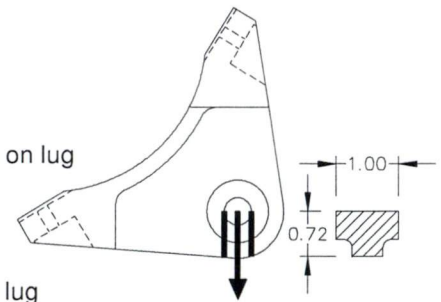


Figure 6.2.4 – Shear Tear Out

Ultimate shear stress on lug

Ultimate shear strength of 6061-T6 aluminum
(ref: MIL-HDBK-5J, over 1" thick)

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

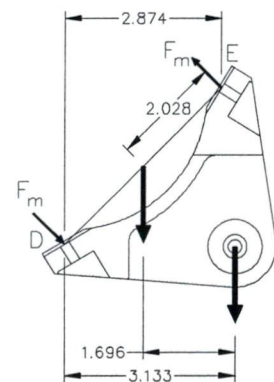


Figure 6.2.5 – Fuselage Bolts
(Aft Fitting)

Moment at centroid of bolts

Vertical reaction at bolt D and E

Distance from bolt centroid of pattern

Sum of centroid distance squared, bolts are equal distance

Moment load on each bolt

Using vector addition, the vertical load and moment load are added together at bolt D and E

$$R_D := 691.1 \text{ lbf}$$

$$R_E := 1636.2 \text{ lbf}$$



Figure 6.2.6 – Vector Addition

The reaction load on bolt D is a few degrees from being pure shear on the bolt.

Bolt E is critical

$$R_{E_t} := R_E \cdot \cos(38.2 \text{ deg})$$

$$R_{E_t} = 1285.8 \text{ lbf}$$

Ultimate tension load on bolt E due to maneuvering load

$$R_{E_s} := R_E \cdot \sin(38.2 \text{ deg})$$

$$R_{E_s} = 1011.8 \text{ lbf}$$

Ultimate shear load on bolt E due to maneuvering load

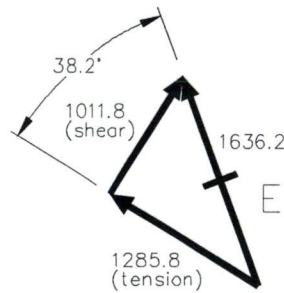


Figure 6.2.7 – Ultimate load on Bolt E due to maneuvering load

Assuming drag reaction is split equally between bolt D and E:

$$R_{E_s_drag} := \frac{R_{b_drag}}{2}$$

$$R_{E_s_drag} = 392.7 \text{ lbf}$$

Ultimate shear load on bolt E due to drag load
where:

$$R_{b_drag} = 785.4 \text{ lbf}$$

Drag reaction on fitting B

$$R_{E_s_total} := \sqrt{R_{E_s}^2 + R_{E_s_drag}^2}$$

$$R_{E_s_total} = 1085.4 \text{ lbf}$$

Total ultimate shear load on bolt E due to
maneuvering load and drag

$$P_{tu_AN3} := 2125 \text{ lbf}$$

Ultimate tensile strength of AN3 bolt
(ref: MIL-HDBK-5J)

$$P_{su_AN3} := 2255 \text{ lbf}$$

Ultimate shear strength of AN3 bolt
(ref: MIL-HDBK-5J)

$$R_1 := \frac{R_{E_s_total}}{P_{su_AN3}}$$

$$R_1 = 0.481$$

Stress (Load) ratio in shear

$$R_2 := \frac{R_{E_t}}{P_{tu_AN3}}$$

$$R_2 = 0.605$$

Stress (Load) ratio in tension

Using the stress interaction ratio, as shown in Bruhn, Figure D1.4:

$$R_1^3 + R_2^2 = 1$$

And the stress interaction curve Figure 1.5.3.5 in MIL-HDBK-5E:

$$R_{1a} := 0.662$$

Allowable shear stress ratio

$$R_{2a} := 0.843$$

Allowable tension stress ratio

$$U := \frac{R_1}{R_{1a}}$$

Strength ratio

$$U = 0.727$$

$$MS := \left(\frac{1}{U} \right) - 1$$

$$MS = 0.375$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

While the margin of safety is positive, the Bell step that is removed was attached with high strength bolts. The fittings will be attached with NAS6603 high strength bolts.

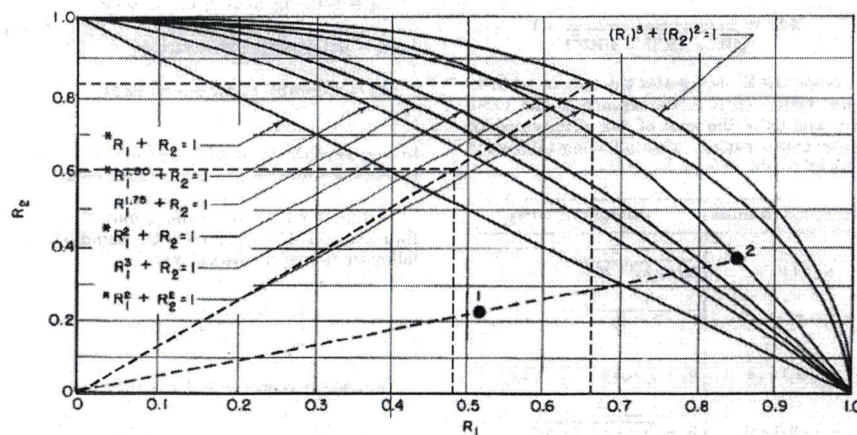


FIGURE 1.5.3.5. Typical interaction curves for combined loading conditions. *Refer to Section 1.5.3.5 for analytical margin of safety.

Figure 6.2.8 – Stress Interaction Curve – AN3 Bolts
(Ref: MIL-HDBK-5E)

On the aft fitting, the loads from the fitting to the upper attachment bolt are critical.
Bolt bearing on fitting:

$$P_{br} := R_{E_s_total}$$

$$P_{br} = 1085.4 \text{bf}$$

Ultimate bearing load on lug

$$A_{br} := 0.375 \text{in} \cdot 0.1875 \text{in}$$

$$A_{br} = 0.0703 \text{in}^2$$

Bearing area

$$f_{br} := \frac{P_{br}}{A_{br}}$$

$$f_{br} = 15.4 \text{ksi}$$

Ultimate bearing stress

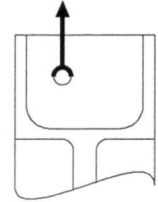


Figure 6.2.9 – Bearing

$$F_{bru_6061} := 52 \text{ksi}$$

Ultimate bearing strength of 6061-T6 aluminum
(ref: MIL-HDBK-5J, thickness over 1", E/D 1.5)

$$MS := \left(\frac{F_{bru_6061}}{f_{br}} \right) - 1$$

$$MS = 2.37$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

Tension on lug:

$$P_t := R_{E_s_total}$$

$$P_t = 1085.4 \text{bf}$$

Ultimate tension load on lug

$$A_t := (1.5 \text{in} - 0.1875 \text{in}) \cdot 0.375 \text{in}$$

$$A_t = 0.492 \text{in}^2$$

Tension area through lug

$$f_t := \frac{P_t}{A_t}$$

$$f_t = 2205.2 \text{psi}$$

Ultimate tensile stress on lug

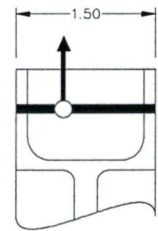


Figure 6.2.10 – Tension

$$F_{tu_6061} := 38 \text{ksi}$$

Ultimate tensile strength of 6061-T6 aluminum
(ref: MIL-HDBK-5J)

$$MS := \left(\frac{F_{tu_6061}}{f_t} \right) - 1$$

$$MS = 16.2$$

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

Shear tear-out on lug:

$$P_{s_{\text{max}}} := R_{E_s_total}$$

$$P_s = 1085.4 \text{ lbf}$$

$$A_s := (0.4375 \text{ in} \cdot 0.375 \text{ in}) \cdot 2$$

$$A_s = 0.328 \text{ in}^2$$

$$f_s := \frac{P_s}{A_s}$$

$$f_s = 3307.8 \text{ psi}$$

$$F_{su_6061} := 19 \text{ ksi}$$

$$MS := \left(\frac{F_{su_6061}}{f_t} \right) - 1$$

$$MS = 7.6$$

Ultimate shear tear-out load on lug

Shear tear-out area through lug

Ultimate shear stress on lug

Ultimate shear strength of 6061-T6 aluminum
(ref: MIL-HDBK-5J, over 1" thick)

Margin of Safety

MARGIN OF SAFETY IS POSITIVE

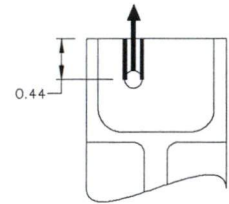


Figure 6.2.11 – Shear Tear-Out

The attachment fittings and fasteners have been demonstrated to be sufficient to carry the required loads.

6.3 Helicopter Attachment Points

The following analysis considers the original Bell cabin step installation as the basis for the loads that may be applied to the fuselage frames that are used for the cargo basket installation.

①

BELL 429

PASSENGER STEP DESIGN CRITERIA

- 3 MEN ON STEP SIMULTANEOUSLY
- 200 LB / MAN
- 2G LIMIT LOAD FACTOR
- "RATIONAL DISTRIBUTION" ON STEP

REF: WALTER FAESSLER
BELL AIRFRAME STRUCTURESSTEP CONFIGURATION

- THREE (3) SUPPORTS LONGITUDINALLY

- F.S. 164.1

- F.S. 200.3

- F.S. 239

(APPROX EQUAL SPACING)

- LATERAL POSITION (AFT FTG. CRITICAL)

- STEP BRKT TOP BOLT B.L. 27.5

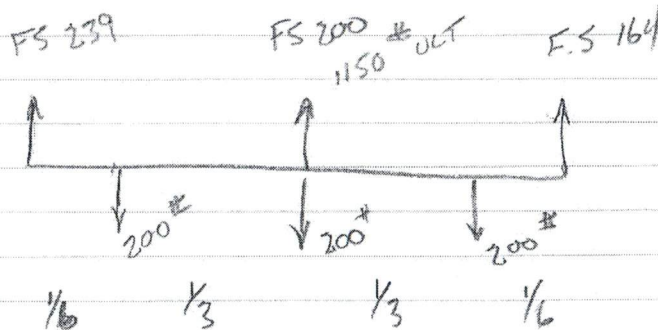
- STEP BRKT BOTTOM BOLT B.L. 24.7

- STEP TREAD \varnothing B.L. 36.0

REF: BELL STEP DRUGS FOR DIMENSIONAL DATA.

(2)

RATIONAL DIST'N SCENARIO # 1



REACTION AT F.S. 200

LOAD CARRIED BY FRAME @ FS 200

$$\text{AFT PERSON } \frac{1}{3} \times 200 = 66.7$$

$$\text{MID PERSON } 200 = 200$$

$$\text{FWD PERSON } \frac{1}{3} \times 200 = 66.7$$

TOTAL VERTICAL LOAD 333.3 #

LIMIT LOAD FACTOR 2.0 G

LIMIT LOAD 666.7

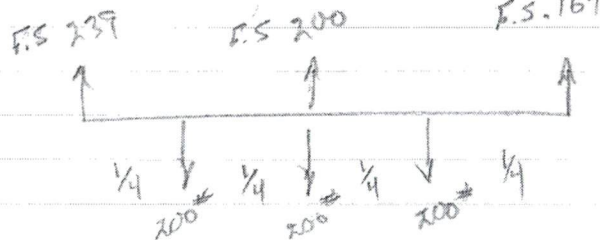
FTG FACTOR 1.15

ULT LOAD FACTOR 1.5

ULT. LOAD 1150 #

(3)

RATIONAL DISTRIBUTION SCENARIO #2



REACTION AT F.S. 200

LOAD CARRIED BY FRAME @ F.S. 200

AFT PERSON $\frac{1}{2} \times 200 = 100$
 MID PERSON 200
 FWD PERSON $\frac{1}{2} \times 200 = 100$

TOTAL VERTICAL LOAD 400 #

LIMIT LOAD FACTOR 2.0 G.

LIMIT LOAD 800. #

FTG. FACTOR 1.15

ULT LOAD FACTOR 1.5

ULT LOAD @ FS 200 1380 #

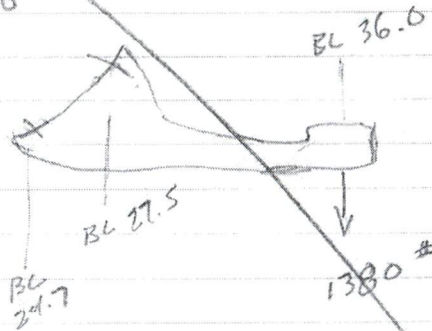
(4)

INTERNAL FRAMES AT F.S. 164, FS 200 & FS 239
ARE SIMILAR. FRAME AT F.S. 239 IS OF
HEAVIER CONSTRUCTION AND FRAMES AT FS 164
AND FS 200 ARE APPROX SAME

ANALYSIS APPLYING AFT LOADS TO CENTRE FRAME
IS A CONSERVATIVE COMPARISON.

(5)

LOADS ON STEP ATTACH FITTING BOLTS
F.S. 200



LESS CONSERVATIVE
DON'T USE FOR
FURTHER ANALYSIS

APPLY ANALYSIS OF FTG, BRUNN D1.17
(LOAD PLUS MOMENT AT CENTROID OF BOLT PATTERN)

$$M = \left[36 - \left(\frac{27.5 + 24.7}{2} \right) \right] \times 1380$$

$$= 9.9 \times 1380$$

$$= 13662 \text{ IN-LB.}$$

$$\text{VERTICAL LOAD ON EACH BOLT} = \frac{1380}{2} = 690 \#$$

$$r = 2.028 \text{ DIST FROM EACH BOLT TO CENTROID.}$$

$$I = 2 r^2$$

$$= 8.2 \text{ IN}^2$$

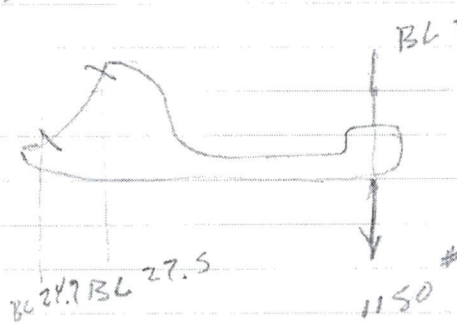
$$F_{\text{MOMENT}} = \frac{M r}{I}$$

$$= \frac{13662 \times 2.028}{8.2}$$

$$= 3,379 \#$$

⑥

LOADS ON STEEP ATTACH FTG BOLTS
 E. S. 200



MORE CONSERVATIVE
 USE FOR FURTHER
 ANALYSIS

APPLY ANALYSIS OF FTG. BRUNN D. 1.17
 (LOAD PLUS MOMENT AT CENTROID OF BOLT PATTERN)

$$M = \left[36 - \left(\frac{27.5 + 24.7}{2} \right) \right] \times 1150$$

$$= 9.9 \times 1150$$

$$= 11,385 \text{ LBS-IN.}$$

$$\text{VERTICAL LOAD ON EACH BOLT} = \frac{1150}{2} = 575 \#$$

$$r = 2.028 \quad \text{DIST FROM EACH BOLT TO CENTROID}$$

$$I = 2 r^2$$

$$= 8.2 \text{ in}^2$$

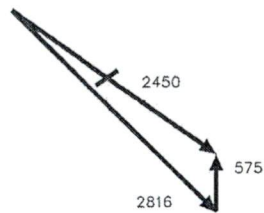
$$F_{\text{MOMENT}} = \frac{M r}{I}$$

$$= \frac{11,385 \times 2.028}{8.2}$$

$$= 2816 \#$$

(7)

THE RESULTING VECTORS FROM THE ADDITION OF THE VERTICAL LOAD AND THE MOMENT LOAD ARE SHOWN IN DIAGRAM BELOW FOR TOP AND BOTTOM BOLT



Bottom Attach Bolt

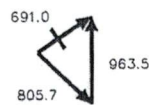


Top Attach Bolt

THE VECTOR LOADS APPLIED BY THE TYPE APPROVED BELL STEP ARE COMPARED TO THE VECTOR LOADS BY THE CRITICAL AERO DESIGN CARGO BASKET LOAD

Cargo Basket Loads

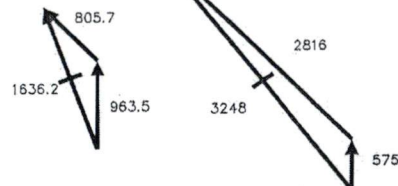
Bell Step Loads



Bottom Attach Bolt

Cargo Basket Loads

Bell Step Loads



Top Attach Bolt

Discussion

Bottom Attachment Fitting Bolt

Resultant load from Aero Design Cargo Basket on the bottom attach bolt is less than $\frac{1}{3}$ in magnitude of the Bell Step load and is applied in a direction which is almost pure shear across the bolt. ie: direct loading along the flange of the fuselage frame with almost no transverse component across the frame member (no bending moment).

Ultimate load from the Cargo Basket on the bottom attachment bolt is less severe than the ultimate load applied from the Bell Step at design condition.

Upper Attachment Fitting Bolt

Resultant load from Aero Design Cargo Basket on the upper attachment bolt is approx $\frac{1}{2}$ in magnitude of the Bell Step load and is applied in a direction approximately the same as that from the Bell Step load.

Ultimate load from the Cargo Basket on the upper attachment bolt is less severe than the ultimate load applied from the Bell Step at design load.

7.0 COMPLIANCE WITH RESERVE ENERGY DROP TEST

CAR 527.727 – Reserve Energy Drop Test

The distance from the bottom of the fuselage to the lowest point of structure that will clear the ground in the reserve energy drop test is 9.26 inches at FS 233.24 to 9.16 inches at FS 212.99, and may be extrapolated to the cross tubes. Limits specified in an email from Bell Helicopters, see Appendix A.

The bottom of the cargo basket, the lowest point of the installation, is 6.3 inches below the bottom of the fuselage. This installation does not affect the compliance shown in the Type Approved configuration.

8.0 COMPLIANCE WITH POSITION AND ANTICOLLISION LIGHTS

CAR 527.1387 – Position Light System Dihedral Angles

The position lights are located on the outboard ends of the horizontal stabilizer, at F.S. 439, WL 72, BL 59.5. The basket installation does not extend past the outboard end of the horizontal stabilizer, and therefore does not block the position lights.

CAR 527.140 – Anticollision Light System

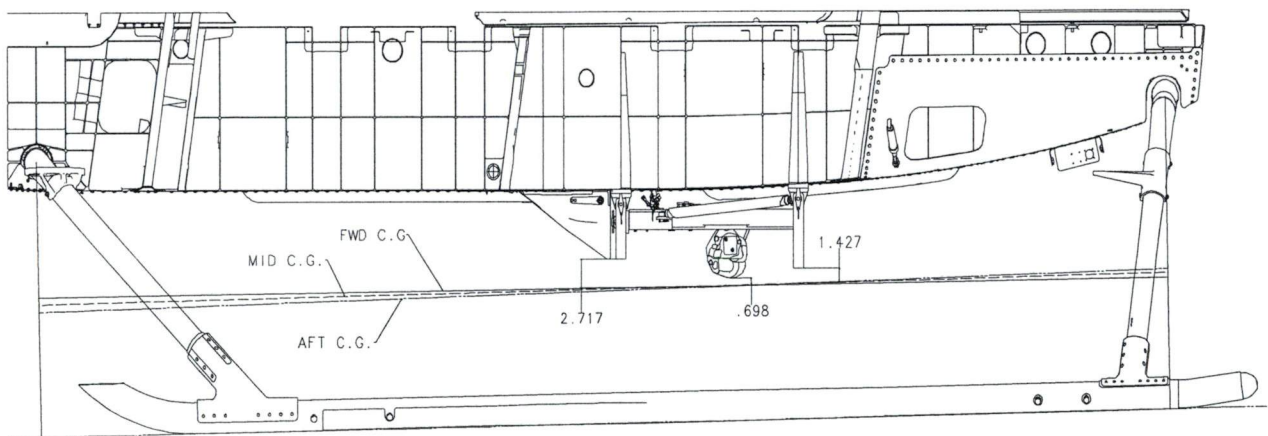
The anticollision light is located at FS 521, WL 150 on top of the vertical fin. The basket has no significant effect on visibility of the anticollision light.

APPENDIX A

EMAIL FROM BELL HELICOPTERS REGARDING GROUND CLEARANCE

From: Faessler, Walter (Bell Helicopters – Mirabel)
Sent: Thursday, September 06, 2012 2:34 PM
To: Faessler, Walter; AERO Design Ltd.
Subject: FW: Cargo hook clearance - ref HEC dual hook
Importance: High

The smallest ground clearance of the 429 (distance between belly and ground) with the current skid gear during a Reserve Energy landing (hardest landing DESIGN case) is 9.26" at FS 233.24 and 9.16" at FS 212.99. You can draw a straight line between these two (2) points, but do NOT extrapolate beyond those points.



BELL 429

PASSENGER STEP DESIGN CRITERIA

- 3 MEN ON STEP SIMULTANEOUSLY
- 200 LB. / MAN
- 2G LIMIT LOAD FACTOR
- "RATIONAL DISTRIBUTION" ON STEP

REF: WALTER FAESSLER
BELL AIRFRAME STRUCTURES

STEP CONFIGURATION

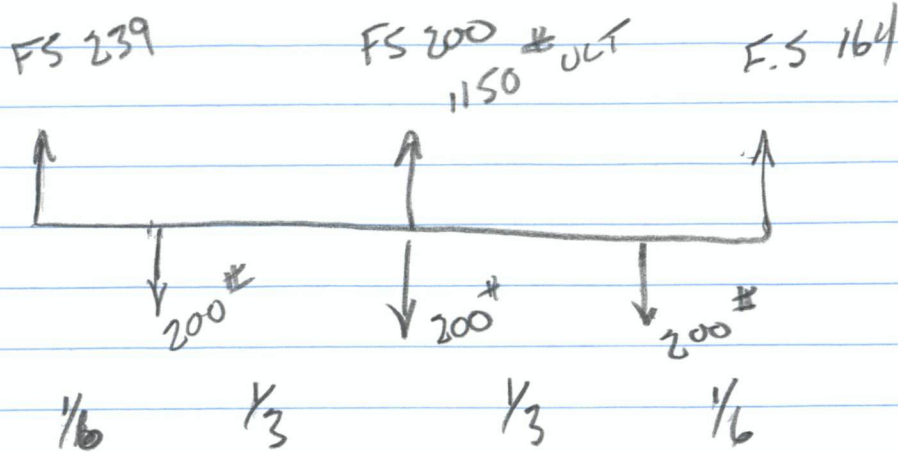
- THREE (3) SUPPORTS LONGITUDINALLY
 - F.S. 164.1
 - F.S. 200.3
 - F.S. 239(APPROX EQUAL SPACING)

- LATERAL POSITION (AFT RTG. CRITICAL)

- STEP BRKT TOP BOLT B.L. 27.5
- STEP BRKT BOTTOM BOLT B.L. 24.7
- STEP TREAD ϕ B.L. 36.0

REF: BELL STEP DRUGS FOR DIMENSIONAL DATA.

RATIONAL DIST'N SCENARIO #1



REACTION AT F.S. 200

LOAD CARRIED BY FRAME @ FS 200

| | |
|------------|---|
| AFT PERSON | $\frac{1}{3} \times 200 = 66.7$ |
| MID PERSON | $200 : 200$ |
| FWD PERSON | $\frac{1}{3} \times 200 = \underline{66.7}$ |

TOTAL VERTICAL LOAD 333.3 #

LIMIT LOAD FACTOR 2.0 6

LIMIT LOAD 666.7

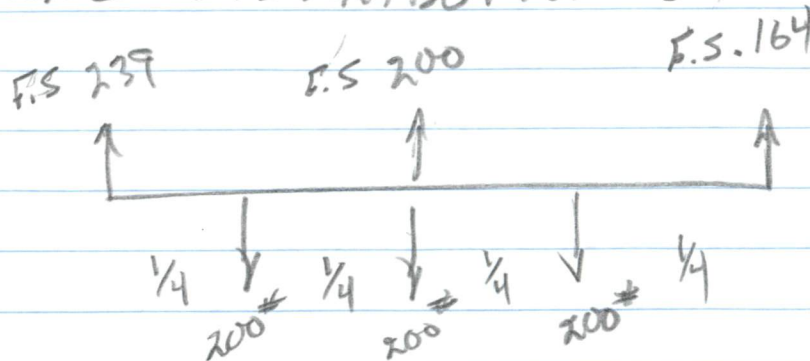
FTG FACTOR 1.15

ULT LOAD FACTOR 1.5

ULT. LOAD

1150 #

RATIONAL DISTRIBUTION SCENARIO #2



REACTION AT F.S. 200

LOAD CARRIED BY FRAME @ F.S. 200

AFT PERSON $\frac{1}{2} \times 200 = 100$

MID PERSON 200

FWD PERSON $\frac{1}{2} \times 200 = 100$

TOTAL VERTICAL LOAD 400 #

LIMIT LOAD FACTOR 2.0 G.

LIMIT LOAD 800. #

FTG. FACTOR 1.15

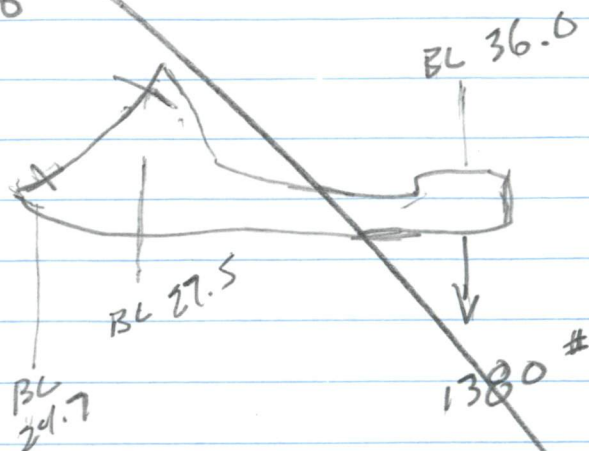
ULT LOAD FACTOR 1.5

ULT LOAD @ FS 200 1380 #

INTERNAL FRAMES AT F.S. 164, FS 200 & FS 239 ARE SIMILAR. FRAME AT F.S. 239 IS OF HEAVIER CONSTRUCTION AND FRAMES AT FS 164 AND FS 200 ARE APPROX SAME

ANALYSIS APPLYING AFT LOADS TO CENTRE FRAME IS A CONSERVATIVE COMPARISON.

LOADS ON STEP ATTACH FITTING BOLTS
F.S. 200



LESS CONSERVATIVE
DONIT USE FOR
FURTHER ANALYSIS

APPLY ANALYSIS OF FTG, BRUNN DI.17

(LOAD PLUS MOMENT AT CENTROID OF BOLT PATTERN)

$$M = \left[36 - \left(\frac{27.5 + 24.7}{2} \right) \right] \times 1380$$

$$= 9.9 \times 1380$$

$$= 13662 \text{ IN-LB.}$$

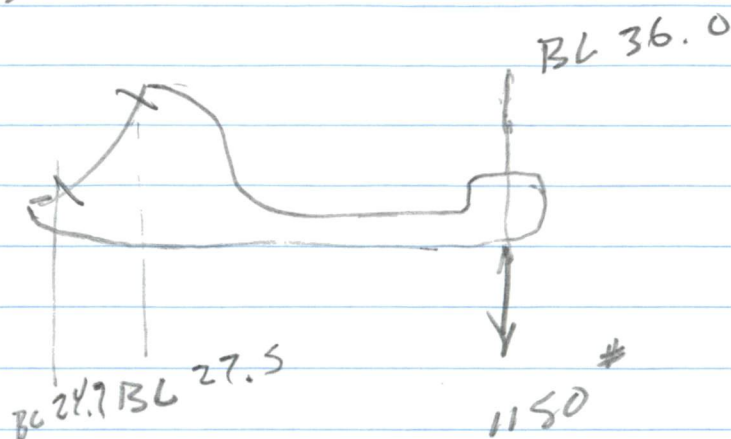
$$\text{VERTICAL LOAD ON EACH BOLT} = \frac{1380}{2} = 690 \#$$

$$r = 2.028 \quad \text{DIST FROM EACH BOLT TO CENTROID.}$$

$$\begin{aligned} I &= 2 r^2 \\ &= 8.2 \text{ IN}^2 \end{aligned}$$

$$\begin{aligned} F_{\text{MOMENT}} &= \frac{M r}{I} \\ &= \frac{13662 \times 2.028}{8.2} \\ &= 3,379 \# \end{aligned}$$

LOADS ON STEP ATTACH FTG BOLTS
E. S. 200



MORE CONSERVATIVE
USE FOR FURTHER
ANALYSIS

APPLY ANALYSIS OF FTG. BRIDEN D. 1.17
(LOAD PLUS MOMENT AT CENTROID OF BOLT PATTERN)

$$M = \left[36 - \left(\frac{27.5 + 24.7}{2} \right) \right] \times 1150$$

$$= 9.9 \times 1150$$

$$= 11,385 \text{ LB-IN.}$$

$$\text{VERTICAL LOAD ON EACH BOLT} = \frac{1150}{2} = 575 \#$$

$$r = 2.028 \quad \text{DIST FROM EACH BOLT TO CENTROID}$$

$$I = 2 r^2$$

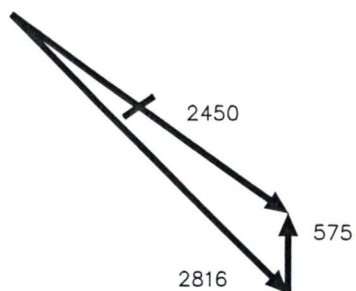
$$= 8.2 \text{ in}^2$$

$$F_{\text{MOMENT}} = \frac{M r}{I}$$

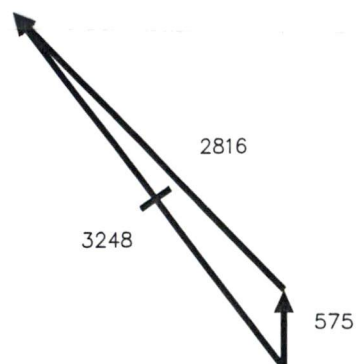
$$= \frac{11,385 \times 2.028}{8.2}$$

$$= 2816 \#.$$

THE RESULTING VECTORS FROM THE ADDITION OF THE VERTICAL LOAD AND THE MOMENT LOAD ARE SHOWN IN DIAGRAM BELOW FOR TOP AND BOTTOM BOLT



Bottom Attach Bolt



Top Attach Bolt

THE VECTOR LOADS APPLIED BY THE TYPE APPROVED BELL STEP ARE COMPARED TO THE VECTOR LOADS BY THE CRITICAL AERO DESIGN CARGO BASKET LOAD

Cargo Basket Loads

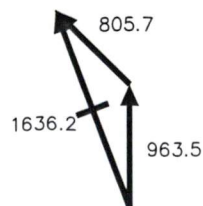


Bottom Attach Bolt

Bell Step Loads

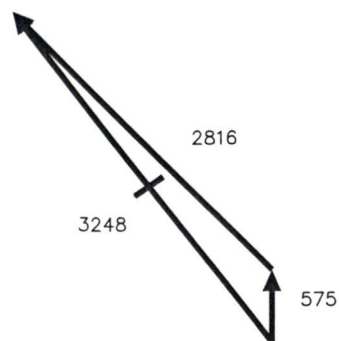


Cargo Basket Loads



Top Attach Bolt

Bell Step Loads



Discussion

Bottom Attachment Fitting Bolt

Resultant load from Aero Design Cargo Basket on the bottom attach bolt is less than $\frac{1}{3}$ in magnitude of the Bell Step load and is applied in a direction which is almost pure shear across the bolt. ie: direct loading along the flange of the fuselage frame with almost no transverse component across the frame member (no bending moment).

Ultimate load from the Cargo Basket on the bottom attachment bolt is less severe than the ultimate load applied from the Bell Step at design condition.

Upper Attachment Fitting Bolt

Resultant load from Aero Design Cargo Basket on the upper attachment bolt is approx $\frac{1}{2}$ in magnitude of the Bell Step load and is applied in a direction approximately the same as that from the Bell Step load.

Ultimate load from the Cargo Basket on the upper attachment bolt is less severe than the ultimate load applied from the Bell Step at design load.

Ted Burgoin

From: Ted Burgoin [ted@aerodesign.ca]
Sent: Tuesday, April 17, 2012 4:33 PM
To: 'wfaessler@bellhelicopter.textron.com'
Cc: 'LJessen@bellhelicopter.textron.com'
Subject: Bell 429 External Cargo Basket -- Loads
 Walter:

Further to our discussion last week, the following is our analysis of the ultimate loads that will be applied by the external cargo basket to helicopter structure due to maneuvering load factor (3.5g) and drag at V_d . A safety factor of 1.5 has been applied and a fitting factor of 1.15 has been applied only to the drag load.

The flight stations (FS) and butt lines (BL) used for the step attachment locations are approximate being scaled off of the flight station drawing in the maintenance manual and hence may not be exactly the numbers you may be use to seeing. See attached SKETCH1.pdf

We have three (3) cargo basket sizes from the Bell 407 that could be applicable to installation on the Bell 429 helicopter:

- a) 21" inside width, 75.75" long supported at front and back
- b) 24.25" inside width, 75.75" long supported at the front and back
- c) 24.25" inside width, 96" long supported at the front and 20.25" fwd of the aft end

Assuming the CofG of the load is at the mid-point of the length of the cargo basket longitudinally and centre of the basket laterally, the critical loads on the forward support beam attachments result from configuration b) above and the critical loads on the aft support beam attachment result from configuration c). These conditions are used in the calculation below for a max cargo load of 300 lb.

The definitions of lengths AC and AB are provided on the attached sketch; LOADS1.pdf

Ideally we would like to accommodate 300 lb. cargo capacity on the wide, long cargo basket.

Loads from the basket are transferred to the helicopter via a tubing beam which will cross laterally underneath the belly and attache to the existing step provisions on each side of the helicopter. The attachments will result in vertical loads only for the maneuvering load condition. There is no moment carried at the step attachment fitting.

Load Summary

Ultimate Loads applied to helicopter structure at existing step fittings.

| | | | | |
|------------|---------|-----------|-----|-----------|
| Max. Cargo | Forward | Reactions | Aft | Reactions |
| | FS | 163.6 | FS | 238.9 |

| | RBL26.5 | LBL -26.5 | RBL 26.5 | LBL -26.5 |
|--------|----------------|--------------|----------------|--------------|
| (lbs.) | Down (lbs.) | Up (lbs.) | Down (lbs.) | Up (lbs.) |
| 300 | 355 | 1379 | 453 | 1758 |
| 250 | 310 | 1202 | 395 | 1532 |
| 200 | 264 | 1025 | 337 | 1307 |
| 150 | 219 | 845 | 279 | 1082 |

Detailed Loads Calculation

PARAMETERS

$n_{man} := 3.5$ maneuvering load factor

$n_{sf} := 1.5$ safety factor

$n_{ff} := 1.15$ fitting factor

Quick Detachable Cargo Basket - Design Weights

$W_{basket} := 70 \cdot \text{lb}$ Weight of basket
(conservative - includes all possible options)

$W_{cargo} := 300 \cdot \text{lb}$ Weight of cargo (max)

$W_{beam} := 10 \cdot \text{lb}$ Weight of beam (each)

$W_{total} := W_{basket} + W_{cargo} + W_{beam} \cdot 2$

$W_{total} = 390 \cdot \text{lb}$ Total weight of basket installation (with cargo)

Load Location Assuptions

- a) Load CofG is located at lateral centreline of cargo basket.
(BL -43.25 for standard basket, BL -44.88 for wide basket)
- b) Load CofG is located at longitudinal centreline of cargo basket.
(FS 201.25 for short cargo basket)
(FS 211.6 for long (8 ft.) cargo basket)

The aft beam is critical with the wide, long cargo basket inst'n because an extended length cargo basket will cantilever past the aft beam, and wide basket is further outboard from centreline (BL -44.88).

The forward beam is critical with the wide, short cargo basket inst'n because the short length cargo basket equally distributes load between forward and aft support beams and wide basket is further outboard from centrlne (BL -44.88)

AFT SUPPORT BEAM REACTIONS

Critical Load on Aft Support Beam applied at FS 238.9 and BL -44.88

Ult. Load on aft beam due to **LONG** basket, aft beam and max cargo load

Moments about FS 163.6

$$P_{ult_aft} := \frac{W_{beam} \cdot n_{man} \cdot n_{sf} (239.6 - 163.6) + (W_{basket} + W_{cargo}) \cdot n_{man} \cdot n_{sf} (211.6 - 163.6)}{238.9 - 163.6}$$

$$P_{ult_aft} = 1305.2 \cdot lbf \quad \begin{array}{l} \text{applied at FS238.9 and BL 44.88} \\ \text{for max cargo weight: } W_{cargo} = 300 \cdot lbf \end{array}$$

$$AC := 44.88 + 26.5$$

$$AB := 26.5 + 26.5$$

Ult. Reactions at helicopter step supports

Moments about A (BL 26.5)

$$R_{b_rear} := \frac{-P_{ult_aft} \cdot AC}{AB}$$

$$R_{b_rear} = -1757.8 \cdot lbf$$

$$R_{a_rear} := -(P_{ult_aft} + R_{b_rear})$$

$$R_{a_rear} = 452.6 \cdot lbf$$

FORWARD SUPPORT BEAM REACTIONS

Critical Load on Forward Support Beam applied at FS 163.6 and BL -44.88

Ult. Load on aft beam due to **SHORT** basket, aft beam and max cargo load
Moments about FS 238.9

$$P_{ult_fwd} := \frac{W_{beam} \cdot n_{man} \cdot n_{sf} (238.9 - 163.6) + (W_{basket} + W_{cargo}) \cdot n_{man} \cdot n_{sf} (201.25 - 163.6)}{238.9 - 163.6}$$

$$P_{ult_fwd} = 1023.8 \cdot \text{lb} \cdot \text{f} \quad \text{applied at FS 163.6 and BL 44.88}$$

for max cargo weight: $W_{cargo} = 300 \cdot \text{lb} \cdot \text{f}$

$$AC := 44.88 + 26.5$$

$$AB := 26.5 + 26.5$$

Ult. Reactions at helicopter step supports
Moments about A (BL 26.5)

$$R_{b_fwd} := \frac{-P_{ult_fwd} \cdot AC}{AB}$$

$$R_{b_fwd} = -1378.8 \cdot \text{lb} \cdot \text{f}$$

$$R_{a_fwd} := - (P_{ult_fwd} + R_{b_fwd})$$

$$R_{a_fwd} = 355 \cdot \text{lb} \cdot \text{f}$$

Summary of Critical Loads

$$R_{a_fwd} = 355 \cdot \text{lb} \cdot \text{f}$$

$$R_{b_fwd} = -1378.8 \cdot \text{lb} \cdot \text{f}$$

$$R_{a_rear} = 452.6 \cdot \text{lb} \cdot \text{f}$$

$$R_{b_rear} = -1757.8 \cdot \text{lb} \cdot \text{f}$$

DRAG LOAD ON BASKET

$$l_{\text{basket}} := 75.75 \cdot \text{in}$$

Length of basket.

$$w_{\text{basket}} := 25 \cdot \text{in}$$

Width of basket.

$$h_{\text{basket}} := 17 \cdot \text{in}$$

Height of basket.

$$A_f := w_{\text{basket}} \cdot h_{\text{basket}}$$

$$A_f = 425 \cdot \text{in}^2$$

Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$$A_p = 1894 \cdot \text{in}^2$$

Planar Area of basket.

$$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.0$$

Fineness ratio of basket

$$C_{Do} := 1.6$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 155 \cdot \text{knots}$$

Never-Exceed-Speed of Bell 429.
(Ref. Bell 429 Flight Manual.)

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 172 \cdot \text{knots}$$

Design Dive Speed of Bell 429

$$\text{Drag} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$$

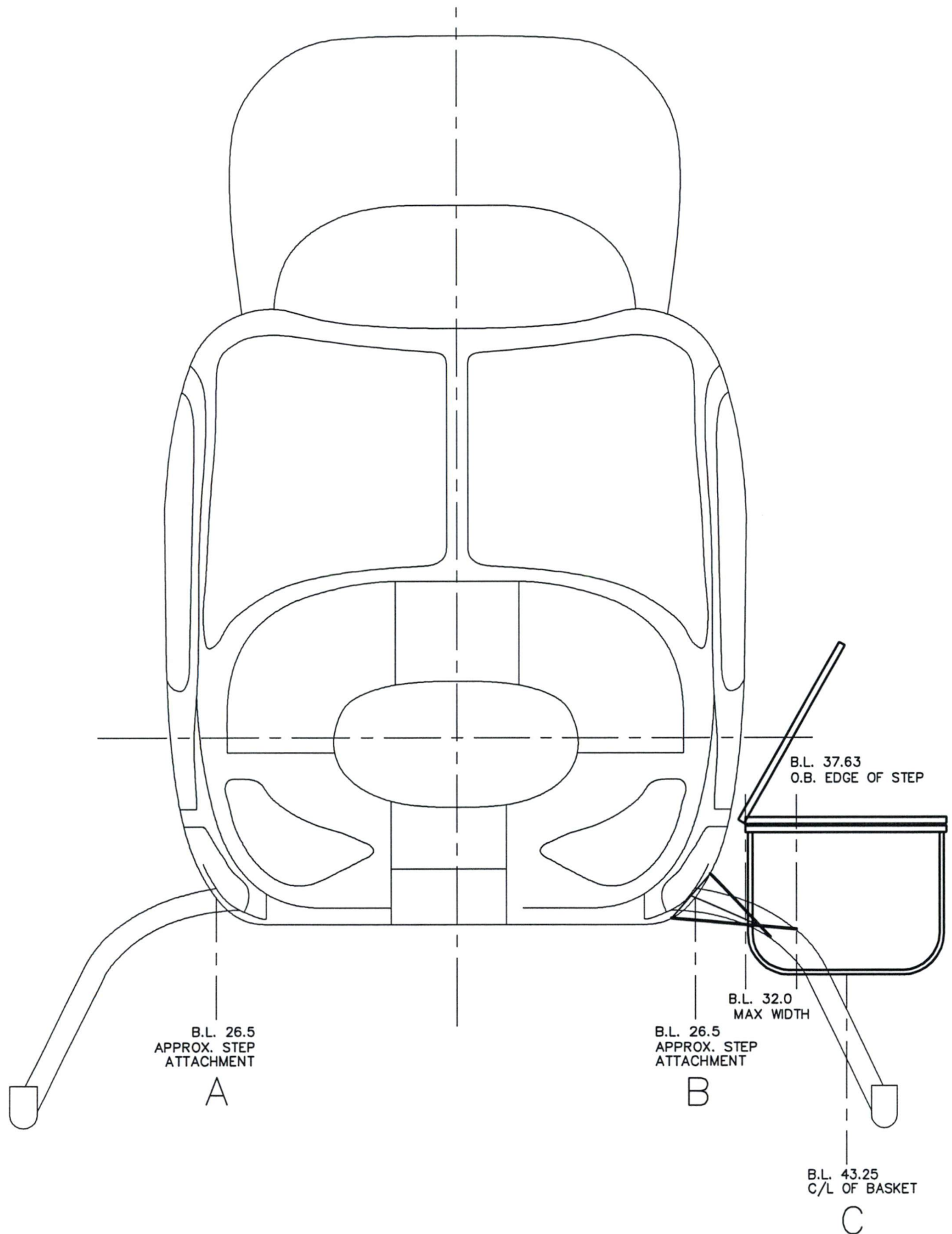
$$\text{Drag} = 474 \cdot \text{lbf}$$

Drag on basket @ V_d .

$$p_{\text{drag_ult}} := \text{Drag} \cdot n_{sf} \cdot n_{ff}$$

$$p_{\text{drag_ult}} = 817 \cdot \text{lbf}$$

Ultimate applied Drag load on basket.



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RPT. XXX-XXX-XXX

1 Cargo Basket

1.1 Analysis

XXX-XXX-XXX-XXX

Loads

The loads are provided by the customer who has the responsibility of developing those loads.

Ultimate drag load is 817 lbf (Ultimate)

Load Summary

Ultimate Loads applied to helicopter structure at existing step fittings.

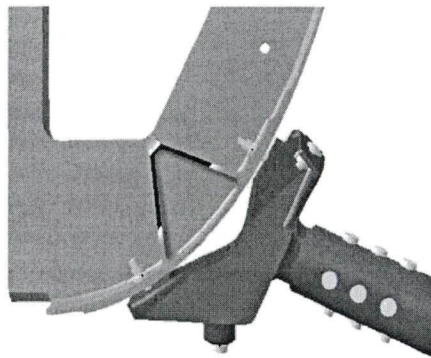
| Max. Cargo | Forward FS | Reactions | Aft FS | Reactions |
|------------|-------------|--------------------|-------------|--------------------|
| | RBL 26.5 | 163.6 LBL -26.5 | RBL 26.5 | 238.9 LBL -26.5 |
| (lbs.) | Down (lbs.) | Up (lbs.) | Down (lbs.) | Up (lbs.) |
| 300 | 355 | 1379 | 453 | 1758 |
| 250 | 310 | 1202 | 395 | 1532 |
| 200 | 264 | 1025 | 337 | 1307 |
| 150 | 219 | 845 | 279 | 1082 |

Assumption

We assume the PAX steps were removed and their attachments were used as fixation points for the cargo basket.

Initial configuration

The PAX steps are attached to the frames (at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) through a step fitting that attach to the frames using 2 fasteners.



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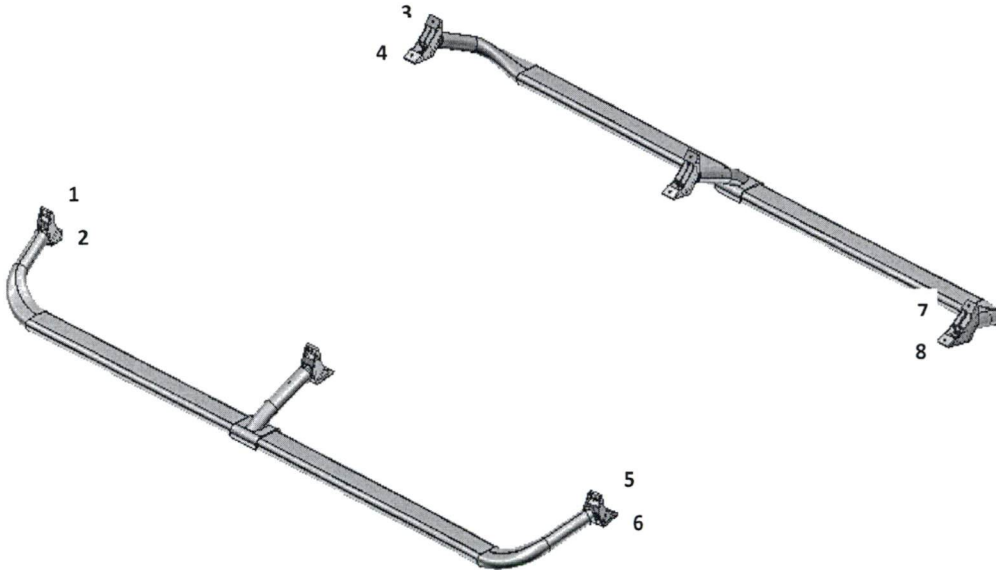
WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et. Seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App. 2401 et. Seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DoD Directive 5230.25.

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XXX-XXX-XXX-XXX



| Fastner | x | y | z |
|---------|------------|------------|----------|
| 1 | 164.099487 | -28.109257 | 11.45468 |
| 2 | 163.61554 | -25.624069 | 8.356253 |
| 3 | 164.099487 | 28.109257 | 11.45468 |
| 4 | 163.61554 | 25.624069 | 8.356253 |
| 5 | 238.987701 | -27.599182 | 11.51144 |
| 6 | 238.543396 | -24.825966 | 8.514116 |
| 7 | 238.987701 | 27.599182 | 11.51144 |
| 8 | 238.543396 | 24.825966 | 8.514116 |

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Initial configuration - No drag load

3-D Weighted fastener pattern analysis (Ref. CASA program CV017P)

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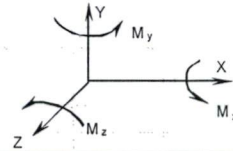
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| Group Properties | | Resultant loads about centroid | |
|------------------|---------|--------------------------------|-----------|
| $X_{xy} :$ | 201.312 | $I_x :$ | 5668.14 |
| $Y_{xy} :$ | 0.000 | $I_y :$ | 11241.47 |
| | | $I_z :$ | 16872.39 |
| $Y_{yz} :$ | 0.000 | | |
| $Z_{yz} :$ | 9.959 | | |
| | | $I_{xy} :$ | 0.00 |
| $X_{xz} :$ | 201.312 | $I_{yz} :$ | 0.00 |
| $Z_{xz} :$ | 9.959 | $I_{xz} :$ | 18.91 |
| | | $F_x :$ | 0.0 |
| | | $F_y :$ | 0.0 |
| | | $F_z :$ | 2329.0 |
| | | $M_x :$ | -104542.5 |
| | | $M_y :$ | -10436.3 |
| | | $M_z :$ | 0.0 |

[illegible]

| | | |
|-----|------|-------|
| max | 2.0 | 835.6 |
| min | -2.0 | 135.0 |

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RPT. XXX-XXX-XXX

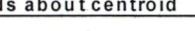
XXX-XXX-XXX-XXX

3-D Weighted fastener pattern analysis (Ref. C.A.S.A. program CV017P)

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| Ref. | Page |

| Group Properties | | Resultant loads about centroid | |
|------------------|---------|--------------------------------|-----------|
| $X_{xy} :$ | 201.312 | $I_x :$ | 5668.14 |
| $Y_{xy} :$ | 0.000 | $I_y :$ | 11241.47 |
| | | $I_z :$ | 16872.39 |
| $Y_{yz} :$ | 0.000 | | |
| $Z_{yz} :$ | 9.959 | | |
| | | $I_{xy} :$ | 0.00 |
| $X_{xz} :$ | 201.312 | $I_{yz} :$ | 0.00 |
| $Z_{xz} :$ | 9.959 | $I_{xz} :$ | 18.91 |
| | | $F_x :$ | 870.0 |
| | | $F_y :$ | 0.0 |
| | | $F_z :$ | 2329.0 |
| | | $M_x :$ | -104542.5 |
| | | $M_y :$ | -11270.8 |
| | | $M_z :$ | 37627.5 |

[illegible]

| | | |
|-----|-------|-------|
| max | 169.4 | 845.2 |
| min | 45.1 | 140.7 |

Max Load amplitude is less than $= \sqrt{169.4^2 + 845.2^2} = 862 \text{ lb}$

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3-D Weighted fastener pattern analysis (Ref. CASA program CV017P)

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| | | |
|-----|-------|------|
| max | 171.3 | 84.1 |
| min | 46.0 | 83.0 |

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XXX-XXX-XXX-XXX

Initial configuration**Comparing Cargo basket loads to Design loads**

| | Design load | Reference | Cargo Basket load |
|-----------------|--------------------------|---|------------------------------------|
| Max tension | 1908 lb tension | 429-030-400 / 4.26.9 Passenger Step Interface | 862 lb |
| | Ultimate | | Max load |
| Max compression | -978 lb compression | 429-030-400 / 4.26.9 Passenger Step Interface | 862 lb |
| | Ultimate | | Max load |
| Max Shear | 1512 lb shear - ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 862 lb Max load amplitude Ultimate |

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XXX-XXX-XXX

Checking attachment wall

Critical loads are at LHS attachment for the full basket including drag loads:

Loads in global axis are:

4 429-030-400 Floor Assy**4.26 429-030-471 Mid Lift Frame****4.26.5 Passenger Step Interface (cont'd)**

429-030-471-101/102

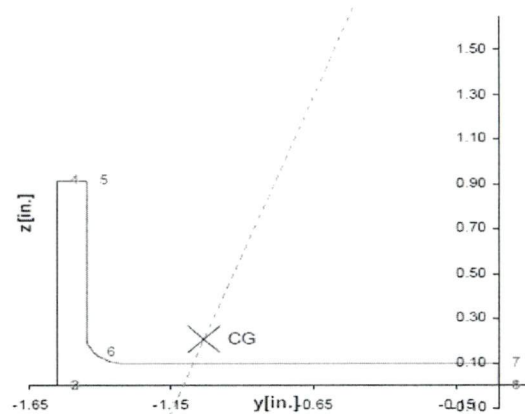
C) Section Properties - Wall analysis

Area = 0.2400 [in.²] $\alpha = 70.58$ Deg
 $Y_{cg} = -1.0307$ [in.] $I_{yy} = 6.595E-02$ [in.⁴]
 $Z_{cg} = 0.2068$ [in.] $I_{zz} = 9.674E-03$ [in.⁴]
 $I_{yy\,cg} = 1.589E-02$ [in.⁴] $I_{zz\,cg} = 5.973E-02$ [in.⁴]
 $I_{yz\,cg} = -1.76E-02$ [in.⁴]

Inertia about Ref.-Axis
 $I_{yy\,ref} = 2.62E-02$ [in.⁴] $I_{yz\,ref} = -6.88E-02$ [in.⁴]
 $I_{zz\,ref} = 3.147E-01$ [in.⁴]

Radius of Gyration
 $r_y = 0.2573$ [in.] $r_z = 0.4989$ [in.]

Extreme Fiber
 $Y_{C\,min} = -0.519$ [in.] $Y_{C\,max} = 1.031$ [in.]
 $Z_{C\,min} = -0.207$ [in.] $Z_{C\,max} = 0.709$ [in.]



| Section Perimeter Coordinates | | | | | | | | | | | |
|-------------------------------|--------|-------|--------|-------|--------|-------|--------|-------|-------|-------|--------|
| POINT | Y | Z | RADIUS | POINT | Y | Z | RADIUS | POINT | Y | Z | RADIUS |
| | [in.] | [in.] | [in.] | | [in.] | [in.] | [in.] | | [in.] | [in.] | [in.] |
| A-1 | 0.000 | 0.000 | | A-5 | -1.450 | 0.916 | | | | | |
| A-2 | -1.550 | 0.000 | | A-6 | -1.450 | 0.100 | 0.125 | | | | |
| A-3 | -1.550 | 0.000 | | A-7 | 0.000 | 0.100 | | | | | |
| A-4 | -1.550 | 0.916 | | A-8 | 0.000 | 0.000 | | | | | |

| 11 Fast- ener | 12 X [in.] | 13 Y [in.] | 14 Z [in.] | 15 Ax | 16 Ay | 17 Az | 18 Px [lb] | 19 Py [lb] | 20 Pz [lb] |
|---------------------|------------------|------------------|------------------|----------|----------|----------|------------------|------------------|------------------|
| 1 | 164.099 | -28.109 | 11.455 | 1.00 | 1.00 | 1.00 | 169 | -55 | 775 |
| 2 | 163.616 | -25.624 | 8.356 | 1.00 | 1.00 | 1.00 | 167 | -113 | 729 |
| 3 | 164.099 | 28.109 | 11.455 | 1.00 | 1.00 | 1.00 | 45 | -55 | -261 |
| 4 | 163.616 | 25.624 | 8.356 | 1.00 | 1.00 | 1.00 | 54 | -113 | -216 |
| 5 | 238.988 | -27.599 | 11.511 | 1.00 | 1.00 | 1.00 | 168 | 112 | 834 |
| 6 | 238.543 | -24.826 | 8.514 | 1.00 | 1.00 | 1.00 | 165 | 56 | 783 |
| 7 | 238.988 | 27.599 | 11.511 | 1.00 | 1.00 | 1.00 | 46 | 112 | -183 |
| 8 | 238.543 | 24.826 | 8.514 | 1.00 | 1.00 | 1.00 | 55 | 56 | -133 |

\\A.011.GEN.CargoBasket.xls B.: 1.0.2.0 Prj.: Rev. May-5-010 Prj.: Rev.: May-5-010 Prt.: Jul-4-12

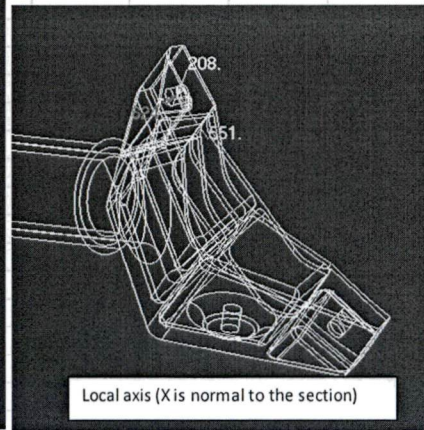
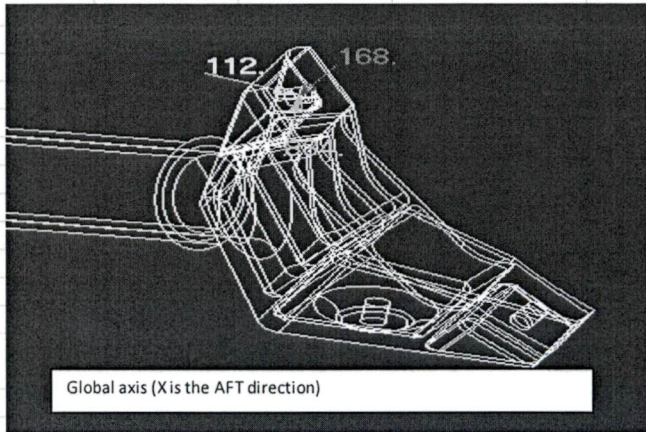
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REPORT FORMMODEL 429 PAGE 1.8RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

Use of PATRAN to transform loads from global axis to the section a local axis (X is normal to the section)

**SAIS Complex bending check**

| Factor | Ult. | No-Yield | Load ID | Name |
|----------------|------|----------|---------|------|
| Main project | 1.00 | 1.00 | | |
| Second project | 1.00 | 1.00 | | |
| Fitting | 1.15 | | | |
| Casting | 1.50 | | | |

No. of Analysis : 2 Main : 1
Section ID : 1 Title : 1.1
Subtitle : 1.1.1

MS Threshold: 1.00

☒ Show MS☒ Peery☐ Yield AnalysisNo. of Points : 8

Analysis Name: _____

Optimisation ID: _____

Optim. Filename: _____

Sect. Prop. filename: oA.008.SP.MidLifFrameSect. Prop. ID : 1

Sect. Prop. Name : _____

Material Code: A/S7050-T7451/2A
Grain direction - Axial : LT Transverse

| | | | |
|-------------------------|---------------------------|----------------------|----------------------|
| $Y_A = 0.000$ [in.] | $Y_B = -1.550$ [in.] | $Y_C = -1.550$ [in.] | $Y_D = -1.450$ [in.] |
| $Z_A = 0.000$ [in.] | $Z_B = 0.000$ [in.] | $Z_C = 0.916$ [in.] | $Z_D = 0.916$ [in.] |
| $Y_E = -1.388$ [in.] | $Y_F = 0.000$ [in.] | $Y_G = 0.100$ [in.] | $Y_H = 0.100$ [in.] |
| $Z_E = 0.163$ [in.] | $Z_F = 0.100$ [in.] | $Z_G = 0.100$ [in.] | $Z_H = 0.100$ [in.] |
| $Y_{CG} = -1.031$ [in.] | Main F.B. filename: _____ | | |
| $Z_{CG} = 0.207$ [in.] | Cut # : <u>1</u> | | |

Insert Sketch

| | PX | VY | VZ | MY | MZ | Cond.: |
|--------|-----|------|-----|----|----|--------|
| Main | 624 | -208 | 551 | 0 | 0 | |
| Second | | | | | | |

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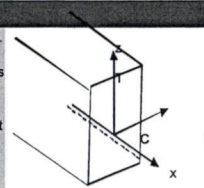
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{ Complex Bending Analysis (Free Body) }

COMPLEXBENDING (FREE BODY) calculates the stress on a section using the complex bending equation. The reference axes follow those of the section properties. The stress sign convention follows the airframe option sign convention. For non-airframe option load (using free-body calculated moment) following the right hand rule, the moments should be applied such as the section property data is looking inward. For which a +My gives tension for a +z and +Mz gives compression for a +y.

Warning! The orientation of the section properties is extremely important. If the orientation is looking outward, inverting the moment is not enough. Reason being that for unsymmetrical section the Iyz gives a different answer (depending from the point of view) leading to major errors.

Use the Ycg and Zcg cell to initialize your points.



1 my documents

1.1 OA

1.1.1 Cargo Basket

Text region

Part Description

xxx-xxx-xxx-xxx

Area = 0.2400 [in.²] Element D:I_{yy} = 0.01589 [in.⁴]I_{zz} = 0.05973 [in.⁴]I_{yz} = 0.0000 [in.⁴]

Ref. Peery

S7050-T7451 Sheet/Plate Spec: AMS4050 Table:
3.7.3.0(b) for thick. of 1.501/2.000 Ref: AR-MMPDS-
02 (A Basis)-Transverse direction.

P_x = 624 [lbs]M_y = 0 [in-lbs]V_y = -208 [lbs]M_z = 0 [in-lbs]V_z = 551 [lbs]

LC:

Ref. Page:

M_y' = -129 [in-lbs] (0-P_x*zcg) [in-lbs]M_z' = -643 [in-lbs] (0+P_x*ycg) [in-lbs]

Allowable

F_{TU} = 74000 [psi]F_{CU} = 67000 [psi]F_{SU} = 43000 [psi]Y_A = 1.031 [in.]Z_A = -0.207 [in.]f_{BA} = -15377 [psi] LimitF_{ALL} = 74000 [psi]R_A = $\frac{15377}{74000} = 0.208$ MS = $\frac{15377}{74000} > 1.00$
Bending - Ult.F(factor) = 1.00 = 1.00
(Ult.)Y_B = -0.519 [in.]Z_B = -0.207 [in.]f_{BB} = -1312 [psi] LimitF_{ALL} = 67000 [psi]R_B = $\frac{1312}{67000} = 0.020$ MS = $\frac{1312}{67000} > 1.00$ Y_C = -0.519 [in.]Z_C = 0.709 [in.]f_{CC} = -8750 [psi] LimitF_{ALL} = 67000 [psi]R_C = $\frac{8750}{67000} = 0.131$ MS = $\frac{8750}{67000} > 1.00$ Y_D = -0.419 [in.]Z_D = 0.709 [in.]f_{DD} = -7674 [psi] LimitF_{ALL} = 67000 [psi]R_D = $\frac{7674}{67000} = 0.115$ MS = $\frac{7674}{67000} > 1.00$ R_E = $\frac{2454}{43000} = 0.057$ Y_E = -0.357 [in.]Z_E = -0.044 [in.]f_{EE} = -882 [psi] LimitF_{ALL} = 67000 [psi]R_E = $\frac{882}{67000} = 0.013$ MS = $\frac{882}{67000} > 1.00$ Y_F = 1.031 [in.]Z_F = -0.107 [in.]f_{FF} = 14565 [psi] LimitF_{ALL} = 74000 [psi]R_F = $\frac{14565}{74000} = 0.197$ MS = $\frac{14565}{74000} > 1.00$

M.S. =

Y_G = #VALUE!Z_G = #VALUE!f_{GG} = #VALUE!F_{ALL} = #VALUE!R_G = $\frac{\#VALUE!}{\#VALUE!} = \#VALUE!$ MS = $\frac{\#VALUE!}{\#VALUE!} > 1.00$ Y_H = #VALUE!Z_H = #VALUE!f_{HH} = #VALUE!F_{ALL} = #VALUE!R_H = $\frac{\#VALUE!}{\#VALUE!} = \#VALUE!$ MS = $\frac{\#VALUE!}{\#VALUE!} > 1.00$

\\L:\COMPLEXBENDING\FreeBody\xtmB: 0Pj: Rev. May-5-010Pj: Rev. May-5-010Prt: Mar-2-12

\\L:\oa.011.GEN.CargoBasket.xlsb B: 1.0.2.0 Pj: Rev. May-5-010 Pj: Rev.: May-5-010 Pj: Jul-4-12

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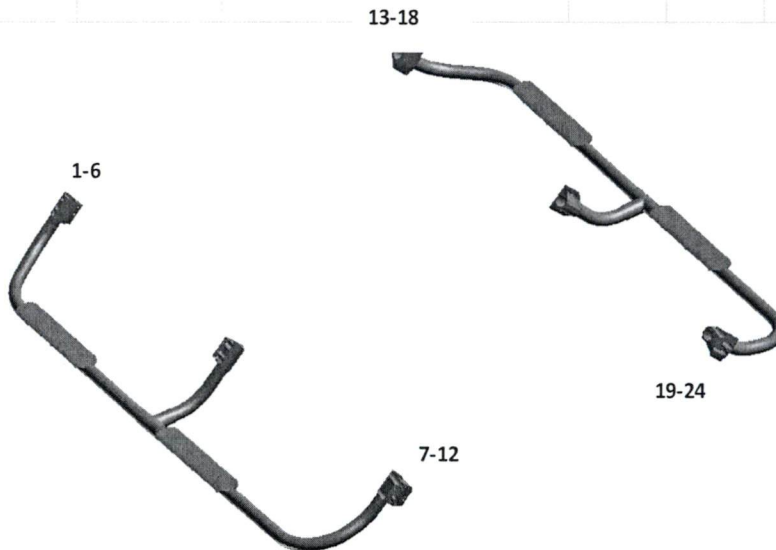
MODEL 429 PAGE 1.10

RPT. XXX-XXX-XXX

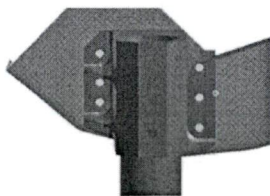
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Weight and cost configuration

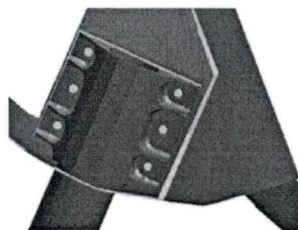
The PAX step is attached directly to the frames
(at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) using 6 fasteners



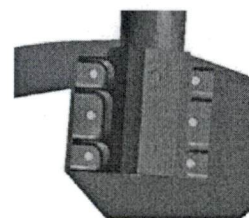
| Fastener | x | y | z |
|----------|---------|----------|---------|
| 1 | 163.339 | -22.8477 | 9.84343 |
| 2 | 163.228 | -23.5396 | 9.14344 |
| 3 | 163.117 | -24.2315 | 8.44345 |
| 4 | 163.615 | -24.6545 | 11.5856 |
| 5 | 163.504 | -25.3464 | 10.8856 |
| 6 | 163.393 | -26.0383 | 10.1856 |
| 7 | 239.186 | -22.46 | 10.0793 |
| 8 | 239.101 | -22.9909 | 9.54215 |
| 9 | 239.042 | -23.3578 | 9.17099 |
| 10 | 239.425 | -24.5814 | 11.5879 |
| 11 | 239.336 | -25.1367 | 11.0261 |
| 12 | 239.247 | -25.692 | 10.4643 |
| 13 | 163.339 | 22.8477 | 9.84343 |
| 14 | 163.228 | 23.5396 | 9.14344 |
| 15 | 163.117 | 24.2315 | 8.44345 |
| 16 | 163.615 | 24.6545 | 11.5856 |
| 17 | 163.504 | 25.3464 | 10.8856 |
| 18 | 163.393 | 26.0383 | 10.1856 |
| 19 | 239.186 | 22.46 | 10.0793 |
| 20 | 239.101 | 22.9909 | 9.54215 |
| 21 | 239.042 | 23.3578 | 9.17099 |
| 22 | 239.425 | 24.5814 | 11.5879 |
| 23 | 239.336 | 25.1367 | 11.0261 |
| 24 | 239.247 | 25.692 | 10.4643 |



Mid Lift Frame



MID Quarter Frame



FWD Quarter Frame

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XXX-XXX-XXX-XXX

Weight and cost configuration - with drag load

3-D Weighted fastener pattern analysis (Ref. CASA program CV017P)

| Applied Loads (Ultimate) | | | | | | | | | |
|--------------------------|-----------------------------|-----------------------------|-----------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|-------------------------------|
| Forces | | | Moments | | | Loads Coordinates | | | |
| 1 Load # | 2 F _x [lb] | 3 F _y [lb] | 4 F _z [lb] | 5 M _x [lb-in] | 6 M _y [lb-in] | 7 M _z [lb-in] | 8 X _i [in.] | 9 Y _i [in.] | 10 Z _i [in.] |
| 1 | 0.0 | 0.0 | 1758.0 | 0.0 | 0.0 | 0.0 | 238.900 | -26.500 | 9.000 |
| 2 | 0.0 | 0.0 | -453.0 | 0.0 | 0.0 | 0.0 | 238.900 | 26.500 | 9.000 |
| 3 | 0.0 | 0.0 | -355.0 | 0.0 | 0.0 | 0.0 | 163.600 | 26.500 | 9.000 |
| 4 | 0.0 | 0.0 | 1379.0 | 0.0 | 0.0 | 0.0 | 163.600 | -26.500 | 9.000 |
| 5 | 870.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 201.250 | -43.250 | 9.000 |
| 6 | | | | | | | | | |

Ref. Page
Ref. Page
Ref. Page
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Ref. Page

| Group Properties | | | Resultant loads about centroid | | |
|---------------------------|-------------------|----------|--------------------------------|-----------|--|
| X _{xy} : 201.294 | x : | 14154.52 | R _x : | 870.0 | |
| Y _{xy} : 0.000 | y : | 34547.86 | R _y : | 0.0 | |
| Y _{yz} : 0.000 | z : | 48658.83 | R _z : | 2329.0 | |
| Z _{yz} : 10.163 | | | M _x : | -104542.5 | |
| X _{xz} : 201.294 | k _{xy} : | 0.00 | M _y : | -11488.1 | |
| Z _{xz} : 10.163 | l _{yz} : | 0.00 | M _z : | 37627.5 | |
| | k _{xz} : | 138.67 | | | |

| 11 Fast- ener | 12 X [in.] | 13 Y [in.] | 14 Z [in.] | 15 A _x | 16 A _y | 17 A _z | 18 P _x [lb] | 19 P _y [lb] | 20 P _z [lb] | 21 P _{axial} [lb] | 22 P _{shear} [lb] |
|---------------------|------------------|------------------|------------------|----------------------|----------------------|----------------------|------------------------------|------------------------------|------------------------------|----------------------------------|----------------------------------|
| 1 | 163.339 | -22.848 | 9.843 | 1.00 | 1.00 | 1.00 | 54 | -31 | 253 | 54 | 255 |
| 2 | 163.228 | -23.540 | 9.143 | 1.00 | 1.00 | 1.00 | 54 | -36 | 258 | 54 | 261 |
| 3 | 163.117 | -24.232 | 8.443 | 1.00 | 1.00 | 1.00 | 55 | -41 | 263 | 55 | 266 |
| 4 | 163.615 | -24.654 | 11.586 | 1.00 | 1.00 | 1.00 | 54 | -18 | 266 | 54 | 267 |
| 5 | 163.504 | -25.346 | 10.886 | 1.00 | 1.00 | 1.00 | 55 | -23 | 271 | 55 | 272 |
| 6 | 163.393 | -26.038 | 10.186 | 1.00 | 1.00 | 1.00 | 56 | -28 | 277 | 56 | 278 |
| 7 | 239.186 | -22.460 | 10.079 | 1.00 | 1.00 | 1.00 | 53 | 28 | 275 | 53 | 277 |
| 8 | 239.101 | -22.991 | 9.542 | 1.00 | 1.00 | 1.00 | 54 | 24 | 279 | 54 | 280 |
| 9 | 239.042 | -23.358 | 9.171 | 1.00 | 1.00 | 1.00 | 54 | 21 | 282 | 54 | 283 |
| 10 | 239.425 | -24.581 | 11.588 | 1.00 | 1.00 | 1.00 | 54 | 39 | 291 | 54 | 294 |
| 11 | 239.336 | -25.137 | 11.026 | 1.00 | 1.00 | 1.00 | 55 | 35 | 295 | 55 | 297 |
| 12 | 239.247 | -25.692 | 10.464 | 1.00 | 1.00 | 1.00 | 55 | 31 | 299 | 55 | 301 |
| 13 | 163.339 | 22.848 | 9.843 | 1.00 | 1.00 | 1.00 | 19 | -31 | -84 | 19 | 90 |
| 14 | 163.228 | 23.540 | 9.143 | 1.00 | 1.00 | 1.00 | 19 | -36 | -89 | 19 | 96 |
| 15 | 163.117 | 24.232 | 8.443 | 1.00 | 1.00 | 1.00 | 19 | -41 | -94 | 19 | 103 |
| 16 | 163.615 | 24.654 | 11.586 | 1.00 | 1.00 | 1.00 | 17 | -18 | -97 | 17 | 99 |
| 17 | 163.504 | 25.346 | 10.886 | 1.00 | 1.00 | 1.00 | 17 | -23 | -103 | 17 | 105 |
| 18 | 163.393 | 26.038 | 10.186 | 1.00 | 1.00 | 1.00 | 17 | -28 | -108 | 17 | 111 |
| 19 | 239.186 | 22.460 | 10.079 | 1.00 | 1.00 | 1.00 | 19 | 28 | -56 | 19 | 63 |
| 20 | 239.101 | 22.991 | 9.542 | 1.00 | 1.00 | 1.00 | 19 | 24 | -60 | 19 | 65 |
| 21 | 239.042 | 23.358 | 9.171 | 1.00 | 1.00 | 1.00 | 19 | 21 | -63 | 19 | 66 |
| 22 | 239.425 | 24.581 | 11.588 | 1.00 | 1.00 | 1.00 | 17 | 39 | -72 | 17 | 82 |
| 23 | 239.336 | 25.137 | 11.026 | 1.00 | 1.00 | 1.00 | 17 | 35 | -76 | 17 | 83 |
| 24 | 239.247 | 25.692 | 10.464 | 1.00 | 1.00 | 1.00 | 17 | 31 | -80 | 17 | 86 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

max 55.8 300.8
min 16.7 62.6

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Comparing Cargo basket loads to Design loads

| | Design load | Reference | Cargo Basket load |
|-----------------|------------------|---|----------------------------|
| Max tension | 483 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | Less than 56.4 lb Ultimate |
| Max Shear | 989 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 300.8 lb Ultimate |
| Max compression | -421 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | -1 lb Ultimate |

Conclusion

In both configurations the Cargo basket loads are less than design loads.

Ted Burgoin

From: Lambert, Edward [elambert@bh.com]

Sent: Monday, November 12, 2012 1:25 PM

To: Ted Burgoin

Subject: FW: Ski basket

FYI

From: Mailhot, Martin

Sent: Monday, November 12, 2012 2:12 PM

To: Lambert, Edward

Subject: Ski basket

Final version...

- Basket 75 lbs
- Step 5 lbs
- Bars and fittings 34 lbs

Total 114 lbs

I also have the info for STA and BL if required

Martin Mailhot






Flight Test Engineer

Phone: (450) 971-6500 x3484

Fax: (450) 437-0438

mmailhot@bh.com

CONFORMITY INSPECTION RECORD

| | | | | | |
|--|---|--------------|---|---------------------|--|
| Applicant Aero Design Ltd. | Aeronautical Product | | | | Title of Change Cargo Basket Installation (959 Configuration) |
| | Make | Model | Serial No. | Registration | |
| | Bell | 429 | | | |
| Drawing No. | Applicant's Inspector Signature Date | | T.C. Inspection Signature Date | | Findings |
| 95910, Rev. 0 |  12 SEPT 2012 | | | | |
| 95911, Rev. 0 |  ↓ | | | | |
| 94612, Rev. 1 |  ↓ | | | | |
| 95930, Rev.0 |  12 SEPT 2012 | | | | |
| 95931, Rev. 0 |  " | | | | |

APPLICANT'S ATTESTATION

TC INSPECTION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

☐ ACCEPTABLE

☐ UNACCEPTABLE

Additional Information:

Remarks:

Signature: _____

Signature: _____

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1 Cargo Basket

1.1 Analysis

XXX-XXX-XXX-XXX

Loads

The loads are provided by the customer who has the responsibility of developing those loads.
Ultimate drag load is 817 lbf (Ultimate)

Load Summary

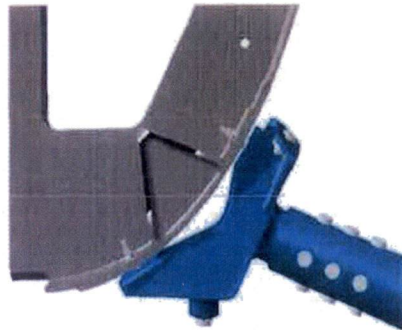
| Max. Cargo | Forward | Reactions | Aft | Reactions |
|------------|-----------|-----------|-----------|-----------|
| | FS | 163.8 | FS | 238.6 |
| | LBL -27.8 | RBL 27.8 | LBL -27.8 | RBL 27.8 |
| (lbs.) | Down | Up | Down | Up |
| | (lbs.) | (lbs.) | (lbs.) | (lbs.) |
| 300 | 270 | 1325 | 352 | 1676 |
| 250 | 230 | 1153 | 301 | 1456 |
| 200 | 190 | 981 | 250 | 1236 |

Assumption

We assume the PAX steps were removed and their attachments were used as fixation points for the cargo basket.

Initial configuration

The PAX steps are attached to the frames (at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) through a step fitting that attach to the frames using 2 fasteners.



\\.\loA.011.GEN CargoBasket2.xls B: 1.0.2.0 Prt.: Nov-7-12

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BY O. ASSIM

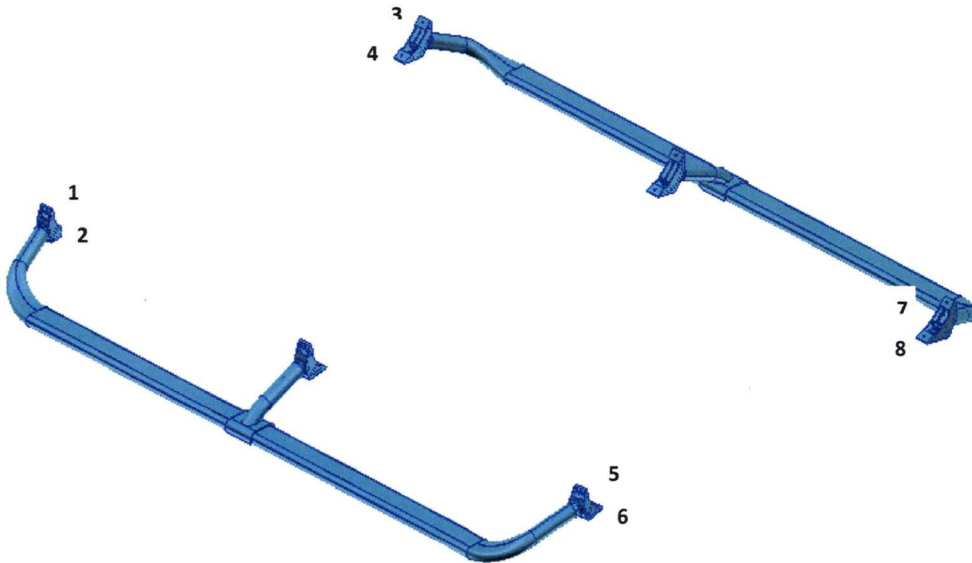
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| Fastner | x | y | z |
|---------|------------|------------|----------|
| 1 | 164.099487 | -28.109257 | 11.45468 |
| 2 | 163.61554 | -25.624069 | 8.356253 |
| 3 | 164.099487 | 28.109257 | 11.45468 |
| 4 | 163.61554 | 25.624069 | 8.356253 |
| 5 | 238.987701 | -27.599182 | 11.51144 |
| 6 | 238.543396 | -24.825966 | 8.514116 |
| 7 | 238.987701 | 27.599182 | 11.51144 |
| 8 | 238.543396 | 24.825966 | 8.514116 |

\\.\loA.011.GEN.CargoBasket2.xlsb B.: 1.0.2.0 Prt.: Nov-7-12

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8000.023.00

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XXX-XXX-XXX-XXX

Initial configuration - No drag load

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

| Applied Loads (Limit) | | | | | | | | | |
|-----------------------|-----------------------------|-----------------------------|-----------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|-------------------------------|
| 1 Load # | Forces | | | Moments | | | Loads Coordinates | | |
| | 2 F _x [lb] | 3 F _y [lb] | 4 F _z [lb] | 5 M _x [lb-in] | 6 M _y [lb-in] | 7 M _z [lb-in] | 8 X _i [in.] | 9 Y _i [in.] | 10 Z _i [in.] |
| 1 | 0.0 | 0.0 | 1676.0 | 0.0 | 0.0 | 0.0 | 238.900 | 27.800 | 9.000 |
| 2 | 0.0 | 0.0 | -352.0 | 0.0 | 0.0 | 0.0 | 238.900 | -27.800 | 9.000 |
| 3 | 0.0 | 0.0 | 1325.0 | 0.0 | 0.0 | 0.0 | 163.600 | 27.800 | 9.000 |
| 4 | 0.0 | 0.0 | -270.0 | 0.0 | 0.0 | 0.0 | 163.600 | -27.800 | 9.000 |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |

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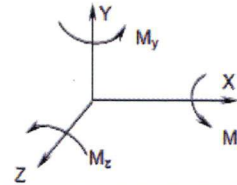
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| Group Properties | | | | Resultant loads about centroid | | | |
|---------------------------|--|---------------------------|--|--------------------------------|--|--|--|
| X _{xy} : 201.312 | | I _x : 5668.14 | | F _x : 0.0 | | | |
| Y _{xy} : 0.000 | | I _y : 11241.47 | | F _y : 0.0 | | | |
| Y _{yz} : 0.000 | | I _z : 16872.39 | | F _z : 2379.0 | | | |
| Z _{yz} : 9.959 | | | | M _x : 100719.4 | | | |
| X _{xz} : 201.312 | | I _{xy} : 0.00 | | M _y : -9981.5 | | | |
| Z _{xz} : 9.959 | | I _{yz} : 0.00 | | M _z : 0.0 | | | |
| | | I _{xz} : 18.91 | | | | | |



| 11 Fast- ener | 12 X [in.] | 13 Y [in.] | 14 Z [in.] | 15 A _x | 16 A _y | 17 A _z | 18 P _x [lb] | 19 P _y [lb] | 20 P _z [lb] | 21 P _{axial} [lb] | 22 P _{shear} [lb] |
|---------------------|------------------|------------------|------------------|----------------------|----------------------|----------------------|------------------------------|------------------------------|------------------------------|----------------------------------|----------------------------------|
| 1 | 164.099 | -28.109 | 11.455 | 1.00 | 1.00 | 1.00 | -1 | -27 | -235 | -1 | 237 |
| 2 | 163.616 | -25.624 | 8.356 | 1.00 | 1.00 | 1.00 | 2 | 28 | -191 | 2 | 193 |
| 3 | 164.099 | 28.109 | 11.455 | 1.00 | 1.00 | 1.00 | -2 | -27 | 764 | -2 | 764 |
| 4 | 163.616 | 25.624 | 8.356 | 1.00 | 1.00 | 1.00 | 1 | 28 | 719 | 1 | 720 |
| 5 | 238.988 | -27.599 | 11.511 | 1.00 | 1.00 | 1.00 | -1 | -27 | -160 | -1 | 162 |
| 6 | 238.543 | -24.826 | 8.514 | 1.00 | 1.00 | 1.00 | 2 | 26 | -111 | 2 | 114 |
| 7 | 238.988 | 27.599 | 11.511 | 1.00 | 1.00 | 1.00 | -2 | -27 | 821 | -2 | 822 |
| 8 | 238.543 | 24.826 | 8.514 | 1.00 | 1.00 | 1.00 | 1 | 26 | 772 | 1 | 772 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

max 1.9 821.7
min -1.9 113.8
max 822 lb

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REPORT FORM

RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

| |
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| Ref. Page |
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CRITICAL

| | | |
|-----|--------|-------|
| max | 170.6 | 826.2 |
| min | 44.1 | 153.9 |
| max | 844 lb | |

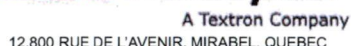
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RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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MODEL 429 PAGE 1.6RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

Initial configuration**Comparing Cargo basket loads to Design loads**

| | Design load | Reference | Cargo Basket load |
|-----------------|---------------------------------|---|---------------------------------------|
| Max tension | 1908 lb tension Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 844 lb Max load amplitude Ultimate |
| Max compression | -978 lb compression Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 844 lb Max load amplitude Ultimate |
| Max Shear | 1512 lb shear - ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 844 lb Max load amplitude Ultimate |

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MODEL 429 PAGE 1.7

RPT. XXX-XXX-XXX

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XXX-XXX-XXX-XXX

Checking attachment wall

Critical loads are at RHS attachment for the full basket including drag loads:

Loads in global axis are:

4 429-030-400 Floor Assy**4.26 429-030-471 Mid Lift Frame****4.26.5 Passenger Step Interface (cont'd)**

429-030-471-101/102

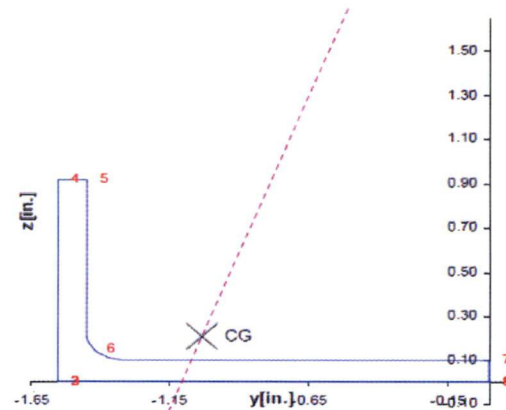
C) Section Properties - Wall analysis

Area = 0.2400 [in.²] $\alpha = 70.58$ Deg
 $Y_{cg} = -1.0307$ [in.] $I_{yp} = 6.595E-02$ [in.⁴]
 $Z_{cg} = 0.2068$ [in.] $I_{zp} = 9.674E-03$ [in.⁴]
 $I_{yy\ cg} = 1.589E-02$ [in.⁴] $I_{zz\ cg} = 5.973E-02$ [in.⁴]
 $I_{yz\ cg} = -1.76E-02$ [in.⁴]

Inertia about Ref.-Axis
 $I_{yy\ ref} = 2.62E-02$ [in.⁴] $I_{yz\ ref} = -6.88E-02$ [in.⁴]
 $I_{zz\ ref} = 3.147E-01$ [in.⁴]

Radius of Gyration
 $r_y = 0.2573$ [in.] $r_z = 0.4989$ [in.]

Extreme Fiber
 $Y_{C\ min} = -0.519$ [in.] $Y_{C\ max} = 1.031$ [in.]
 $Z_{C\ min} = -0.207$ [in.] $Z_{C\ max} = 0.709$ [in.]



| Section Perimeter Coordinates | | | | | | | | | | | |
|-------------------------------|--------|-------|--------|-------|--------|-------|--------|-------|-------|-------|--------|
| POINT | Y | Z | RADIUS | POINT | Y | Z | RADIUS | POINT | Y | Z | RADIUS |
| | [in.] | [in.] | [in.] | | [in.] | [in.] | [in.] | | [in.] | [in.] | [in.] |
| A-1 | 0.000 | 0.000 | | A-5 | -1.450 | 0.916 | | | | | |
| A-2 | -1.550 | 0.000 | | A-6 | -1.450 | 0.100 | 0.125 | | | | |
| A-3 | -1.550 | 0.000 | | A-7 | 0.000 | 0.100 | | | | | |
| A-4 | -1.550 | 0.916 | | A-8 | 0.000 | 0.000 | | | | | |

Critical loads (Basket load + Drag load)

| 11 Fast- ener | 12 X [in.] | 13 Y [in.] | 14 Z [in.] | 15 Ax | 16 Ay | 17 Az | 18 Px [lb] | 19 Py [lb] | 20 Pz [lb] | 21 P _{axial} [lb] | 22 P _{shear} [lb] |
|---------------------|------------------|------------------|------------------|----------|----------|----------|------------------|------------------|------------------|----------------------------------|----------------------------------|
| 1 | 164.099 | -28.109 | 11.455 | 1.00 | 1.00 | 1.00 | 171 | -110 | -238 | 171 | 262 |
| 2 | 163.616 | -25.624 | 8.356 | 1.00 | 1.00 | 1.00 | 168 | -56 | -194 | 168 | 202 |
| 3 | 164.099 | 28.109 | 11.455 | 1.00 | 1.00 | 1.00 | 44 | -110 | 761 | 44 | 769 |
| 4 | 163.616 | 25.624 | 8.356 | 1.00 | 1.00 | 1.00 | 53 | -56 | 717 | 53 | 719 |
| 5 | 238.988 | -27.599 | 11.511 | 1.00 | 1.00 | 1.00 | 169 | 57 | -157 | 169 | 167 |
| 6 | 238.543 | -24.826 | 8.514 | 1.00 | 1.00 | 1.00 | 166 | 109 | -108 | 166 | 154 |
| 7 | 238.988 | 27.599 | 11.511 | 1.00 | 1.00 | 1.00 | 45 | 57 | 824 | 45 | 826 |
| 8 | 238.543 | 24.826 | 8.514 | 1.00 | 1.00 | 1.00 | 54 | 109 | 775 | 54 | 782 |

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MODEL 429 PAGE 1.8

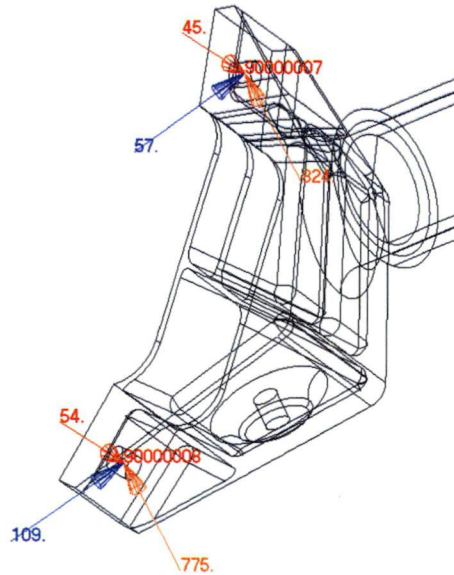
RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

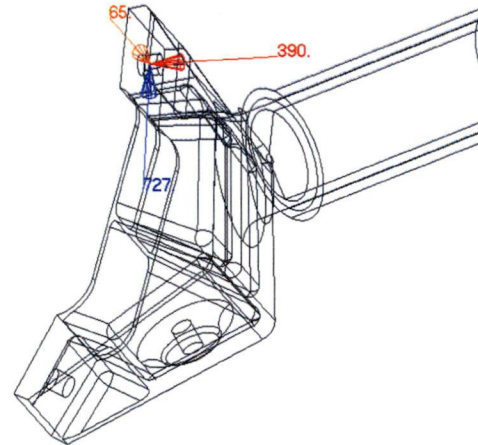
Critical loads at the RHS AFT (fasteners #7 and #8)

Use of PATRAN to transform loads from global axis to the section a local axis (X is normal to the section)

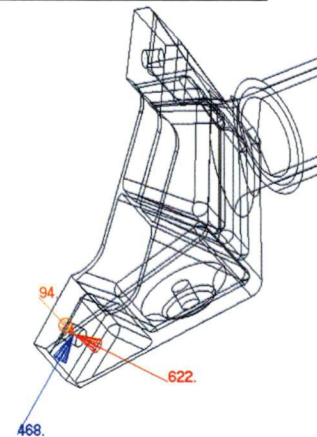
Global axis (X is the AFT direction)



Local axis (X is normal to the section)



Local axis (X is normal to the section)



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RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

SAIS Complex bending checkArea = 0.2400 [in.²] Element ID : $I_{yy} = 0.01589$ [in.⁴] $I_{zz} = 0.05873$ [in.⁴] $I_{yz} = 0.0000$ [in.⁴]

Ref. Peery

S7050-T7451 Sheet/Plate Spec.: AMS4050
Table: 3.7.3.0(b1) for thick. of 1.501/2.000 Ref.: AR-
MMPDS-02 (A Basis) - Transverse direction.

$P_x = 622$ [lbs] $M_y = 0$ [in.-lbs]
 $V_y = 468$ [lbs] $M_z = 0$ [in.-lbs]
 $V_z = 94$ [lbs] LC :

Ref. Page :

$M_y' = -129$ [in.-lbs] (0 -Px*zcg) [in.-lbs]
 $M_z' = -541$ [in.-lbs] (0 +Px*ycg) [in.-lbs]

Allowable
 $F_{TU} = 74000$ [psi]
 $F_{CY} = 67000$ [psi]
 $F_{BU} = 43000$ [psi]

$Y_A = 1.031$ [in.]
 $Z_A = -0.207$ [in.]

$f_{SA} = 15328$ [psi] Limit
 $F_{ALL} = 74000$ [psi]

$R_A = \frac{17627}{74000} = 0.238$

MS = $\frac{1.00}{1.00}$
Bending - Ult.

F(factor) = $1.00 \times 1.15 = 1.15$
(Ult., Fitting)

$Y_B = -0.519$ [in.]
 $Z_B = -0.207$ [in.]
 $Y_C = -0.519$ [in.]
 $Z_C = 0.709$ [in.]

$f_{SB} = -1308$ [psi] Limit
 $F_{ALL} = 67000$ [psi]
 $f_{SC} = -8722$ [psi] Limit
 $F_{ALL} = 67000$ [psi]

$R_B = \frac{1505}{67000} = 0.022$
 $R_C = \frac{10031}{67000} = 0.150$

MS = $\frac{1.00}{1.00}$
MS = $\frac{1.00}{1.00}$

$R_B = \frac{2287}{43000} = 0.053$

$Y_D = -0.419$ [in.]
 $Z_D = 0.709$ [in.]

$f_{SD} = -7649$ [psi] Limit
 $F_{ALL} = 67000$ [psi]

$R_D = \frac{8796}{67000} = 0.131$

MS = $\frac{1.00}{1.00}$

$Y_E = -0.357$ [in.]
 $Z_E = -0.044$ [in.]

$f_{SE} = -879$ [psi] Limit
 $F_{ALL} = 67000$ [psi]

$R_E = \frac{1011}{67000} = 0.015$

MS = $\frac{1.00}{1.00}$

$Y_F = 1.031$ [in.]
 $Z_F = -0.107$ [in.]

$f_{SF} = 14519$ [psi] Limit
 $F_{ALL} = 74000$ [psi]

$R_F = \frac{16696}{74000} = 0.226$

MS = $\frac{1.00}{1.00}$

M.S. = $\frac{1}{F \cdot \sqrt{R_B^2 + R_F^2}} - 1$

$Y_G = 1.031$ [in.]
 $Z_G = -0.107$ [in.]

$f_{SG} = 14519$ [psi] Limit
 $F_{ALL} = 74000$ [psi]

$R_G = \frac{16696}{74000} = 0.226$

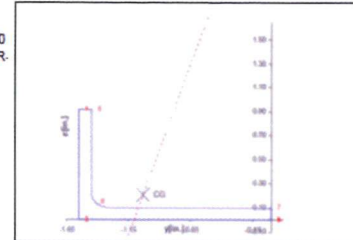
MS = $\frac{1.00}{1.00}$

$Y_H = 1.031$ [in.]
 $Z_H = -0.107$ [in.]

$f_{SH} = 14519$ [psi] Limit
 $F_{ALL} = 74000$ [psi]

$R_H = \frac{16696}{74000} = 0.226$

MS = $\frac{1.00}{1.00}$



$$f_x = \frac{P_x}{A} - \frac{(M_y I_{yz} + M_z I_{yy})^* y}{I_{yy} I_{zz} - I_{yz}^2} + \frac{(M_z I_{yz} + M_y I_{yy})^* z}{I_{yy} I_{zz} - I_{yz}^2}$$

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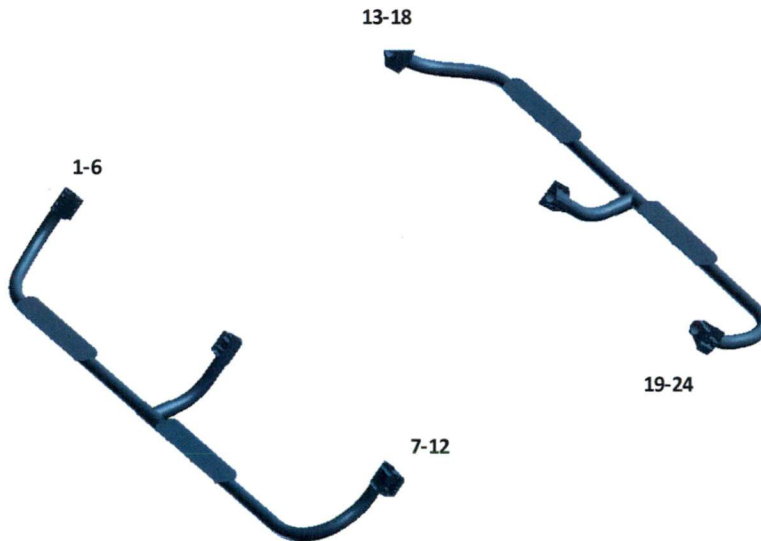
MODEL 429 PAGE 1.10

RPT. XXX-XXX-XXX

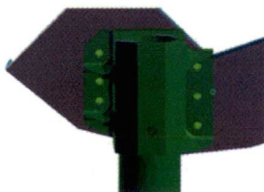
XXX-XXX-XXX-XXX

Weight and cost configuration

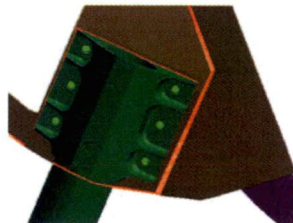
The PAX step is attached directly to the frames
(at the FW Quarter Frame, the Mid Quarter Frame and Mid Lift Frame) using 6 fasteners



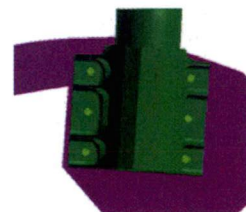
| Fastener | x | y | z |
|----------|---------|----------|---------|
| 1 | 163.339 | -22.8477 | 9.84343 |
| 2 | 163.228 | -23.5396 | 9.14344 |
| 3 | 163.117 | -24.2315 | 8.44345 |
| 4 | 163.615 | -24.6545 | 11.5856 |
| 5 | 163.504 | -25.3464 | 10.8856 |
| 6 | 163.393 | -26.0383 | 10.1856 |
| 7 | 239.186 | -22.46 | 10.0793 |
| 8 | 239.101 | -22.9909 | 9.54215 |
| 9 | 239.042 | -23.3578 | 9.17099 |
| 10 | 239.425 | -24.5814 | 11.5879 |
| 11 | 239.336 | -25.1367 | 11.0261 |
| 12 | 239.247 | -25.692 | 10.4643 |
| 13 | 163.339 | 22.8477 | 9.84343 |
| 14 | 163.228 | 23.5396 | 9.14344 |
| 15 | 163.117 | 24.2315 | 8.44345 |
| 16 | 163.615 | 24.6545 | 11.5856 |
| 17 | 163.504 | 25.3464 | 10.8856 |
| 18 | 163.393 | 26.0383 | 10.1856 |
| 19 | 239.186 | 22.46 | 10.0793 |
| 20 | 239.101 | 22.9909 | 9.54215 |
| 21 | 239.042 | 23.3578 | 9.17099 |
| 22 | 239.425 | 24.5814 | 11.5879 |
| 23 | 239.336 | 25.1367 | 11.0261 |
| 24 | 239.247 | 25.692 | 10.4643 |



Mid Lift Frame



MID Quarter Frame



FWD Quarter Frame

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Weight and cost configuration - with drag load

3-D Weighted fastener pattern analysis(Ref. CASA program CV017P)

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| |
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| Group Properties | | | Resultant loads about centroid | | |
|------------------|---------|------------|--------------------------------|---------|----------|
| $X_{xy} :$ | 201.294 | $b_x :$ | 14154.52 | $F_x :$ | 870.0 |
| $Y_{xy} :$ | 0.000 | $l_y :$ | 34547.86 | $F_y :$ | 0.0 |
| | | $l_z :$ | 48658.83 | $F_z :$ | 2379.0 |
| $Y_{yz} :$ | 0.000 | | | $M_x :$ | 100719.4 |
| $Z_{yz} :$ | 10.163 | | | $M_y :$ | -11034.1 |
| | | $b_{xy} :$ | 0.00 | $M_z :$ | 37627.5 |
| $X_{xz} :$ | 201.294 | $l_{yz} :$ | 0.00 | | |
| $Z_{xz} :$ | 10.163 | $l_{xz} :$ | 138.67 | | |

[illegible]

| | | |
|-----|--------|-------|
| max | 56.9 | 295.6 |
| min | 15.6 | 57.6 |
| max | 301 lb | |

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RPT. XXX-XXX-XXX

XXX-XXX-XXX-XXX

Comparing Cargo basket loads to Design loads

| | Design load | Reference | Cargo Basket load |
|-----------------|------------------|---|------------------------------------|
| Max tension | 483 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 301 lb Max load amplitude Ultimate |
| Max Shear | 989 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 301 lb Max load amplitude Ultimate |
| Max compression | -421 lb Ultimate | 429-030-400 / 4.26.9 Passenger Step Interface | 301 lb Max load amplitude Ultimate |

Conclusion

In both configurations the Cargo basket loads are less than design loads.

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T5J 4E6

Your file Votre référence

Our file Notre référence
C-12-0852
5010-0402

November 13, 2012

AERO Design Limited
2013 39 Ave. NE
Calgary, AB
T2E 6R7

ATTENTION: EDWARD BURGOIN – DAR290M

Dear Sirs:

**SUBJECT: Extension of DAR 290M Authority – Bell 429 Cargo Basket
 STC Number SH12-58 – Issue 1**

This letter is in response to your 02 November 2012, request for extension of delegation to cover the subject design change. You are hereby authorized to make findings of compliance for the following paragraphs as listed in Compliance Plan CP959, Revision 0:

| | |
|----------|---------------------------------------|
| 527.727 | Reserve Energy Absorption Drop Test |
| 527.1387 | Position Light System Dihedral Angles |
| 527.1401 | Anti-Collision Light System |

This is a one-time extension and is limited to be exercised for this approval only.

If you have any questions or wish to discuss this project further, please contact the project OPI, Jack Staal at the Edmonton TCC.

Yours truly,

F.J.B. Wright
Technical Team Lead, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-3856
Facs: 780-495-7963

Canada

AERO DESIGN LTD.

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

www.aerodesign.ca

02 November 2012

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File : C-12-0852

Our File : 959

Re: Bell 429 Cargo Basket

Jack,

Please extend my delegation to include the following paragraphs of CAR 527 as indicated on compliance program CP959 revision 0 (uploaded to NAPA):

527.727 - Reserve Energy Absorption Drop Test
527.1387 - Position Light System Dihedral Angles
527.1401 - Anti-Collision Light System

Regards,



E. Burgoin, DAR 290M

Encl.

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 06 September 2012
REV. No. 0

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 429

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: CAR527, Change 527-6
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-6

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|-----------------------------------|---|-------------------------------------|-----|-----|---|
| Subpart B – Flight | | | | | |
| 527.27 | Centre of Gravity Limits | N/A | | | No change from Type Approval. |
| 527.29 | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | | X | |
| 527.51 | Takeoff | Flight Test | X | | Flight tests to be performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter |
| 527.65 | Climb: All Engines Operating | Flight Test | X | | |
| 527.67 | Climb: One Engine Inoperative | Flight Test | X | | |
| 527.71 | Gliding Performance | Flight Test | X | | |
| 527.75 | Landing | Flight Test | X | | |
| 527.141 | Flight Characteristics – General | Flight Test | X | | |
| 527.143 | Controllability and Maneuverability | Flight Test | X | | |
| 527.171 | Stability – General | Flight Test | X | | |
| 527.173 | Longitudinal Stability | Flight Test | X | | |
| 527.175 | Demonstration of Longitudinal Stability | Flight Test | X | | |
| 527.177 | Static Directional Stability | Flight Test | X | | |
| 527.231 | Ground and Water Handling - General | Flight Test | X | | |
| 527.241 | Ground Resonance | Flight Test | X | | |
| 527.251 | Vibration | Flight Test | X | | |
| Subpart C – Strength Requirements | | | | | |
| 527.301 | Loads – Air Drag Loads | Analysis | | X | |
| 527.301 | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | | X | |
| 527.303 | Factor of Safety | Analysis | | X | |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|--|------------------------------------|-----|-----|---|
| 527.305 | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.307 | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | Critical load factor in downward direction. |
| 527.547 | Main Rotor Structure | Flight Test | X | | See comments for flight test above |
| 527.561 | Emergency Landing Conditions | | | | |
| 527.561(a) | General | N/A | | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |
| Subpart D – Design and Construction | | | | | |
| 527.601 | Design | Drawings | | X | Design is conventional. |
| 527.603 | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 | Protection of Structure | Drawings | | X | |
| 527.611 | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 | Fitting Factor | Analysis | | X | |
| 527.727 | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.783 | Doors | N/A | | | Installation does not block doors. |
| 527.787(a) | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 | External Load Attaching Means | N/A | | | Cargo basket is classified as a cargo compartment |
| 527.1387 | Position Light System Dihedral Angles | Statement | | ** | Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|---|-----|-----|--|
| 527.1401 | Anti-collision Light System | Statement | | ** | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 | Never Exceed Speed | Flight Test, Flight Manual Supplement | X | | V _{NE} limits to be verified by flight test. |
| 527.1525 | Kinds of Operation | Flight Manual Supplement | X | | Limited to VFR only. |
| 527.1529 | Instructions for Continuing Airworthiness | ICA Provided | X | | |
| 527.1557(a) | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | X | |
| 527.1557(b) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 | Rotorcraft Flight Manual – General | Flight Manual Supplement | X | | |
| 527.1583(c) | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | X | | |
| 527.1585 | Operating Procedures | Flight Manual Supplement | X | | |
| 527.1587 | Performance Information | Flight Manual Supplement | X | | |
| 527.1589 | Loading Information | Flight Manual Supplement & Placard | X | | Placard installed on basket <i>dd</i> |
| Airworthiness Manual Requirements | | | | | |
| 5527.1581(e) | Rotorcraft Flight Manual – Units | SI and Imperial Units provided in Flight Manual Supplement | X | | |

AERO Design Ltd.

**ENGINEERING REPORT
ER959.02**

BELL 429

**QUICK RELEASE CARGO BASKET
LOAD TEST REPORT**

Prepared by: Jeff Clarke, CET

Approved by: E. Burgoin, P.Eng., DAR 290M

Revision 0, 06 September 2012

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1.0 INTRODUCTION

This report is to demonstrate that the cargo basket and attachments for the Bell 429 are capable of supporting a 300 lb cargo load.

2.0 REFERENCE TEXT

AERO Design Ltd. Reports ER959.01

AERO Design Ltd. Drawings 95910, 95911, 95912, 95930, 95931

3.0 BASIS OF CERTIFICATION

TCDS H-107:

Airworthiness Manual (AWM) Chapter 527 – *Normal Category Rotorcraft* at Change 527-6 published June 1, 2005 (equivalent to FAR part 27 at Amdt. 27-40), including Appendix B for IFR and Appendix C for Category A, plus

FAR Part 27, Amdt. 27-44, effective June 16, 2008 as adopted by reference

AWM Chapter 527 Appendix C – *Criteria for Category A* specifies certain sections of AWM Chapter 529 – *Transport Category Rotorcraft*. For these specified sections, AWM Chapter 529 at Change 529-6 published June 30, 2008 (equivalent to FAR Part 29 at Amdt. 29-45) is applicable, plus FAR 29.1587(a)(7) Amdt. 29-51, effective March 31, 2008 as adopted by reference.

This report demonstrates that the installation of the Quick Release Cargo Basket (945 configuration) complies with the original basis of certification.

4.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

There are currently no Airworthiness Directives applicable to the Bell 429.

5.0 LOADS

Quick Release Cargo Basket - Bell 429

CAR 527.561(d)

| | |
|--|----------------------|
| Ultimate Upward Emergency Landing Load Factor: | $n_{e_up} := 1.5$ |
| Ultimate Forward Emergency Landing Load Factor: | $n_{e_fwd} := 4.0$ |
| Ultimate Sideward Emergency Landing Load Factor: | $n_{e_side} := 2.0$ |
| Ultimate Downward Emergency Landing Load Factor: | $n_{e_down} := 4.0$ |

CAR 527.625

Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

CAR 527.303

Safety Factor: $n_{sf} := 1.5$

CAR 527.337(a)

$$n_{man_ult} := n_{man} \cdot n_{sf}$$

| | |
|--|-----------------------|
| Limit Positive Maneuvering Load Factor: | $n_{man} := 3.5$ |
| Ultimate Positive Maneuvering Load Factor: | $n_{man_ult} = 5.25$ |

$$n_{man_neg_u} := n_{man_neg} \cdot n_{sf}$$

| | |
|--|--------------------------|
| Limit Negative Maneuvering Load Factor: | $n_{man_neg} := -1.0$ |
| Ultimate Negative Maneuvering Load Factor: | $n_{man_neg_u} = -1.5$ |

CRITICAL ULTIMATE LOAD FACTORS:

| | | |
|-----------|--|-----------------------|
| Downward: | Ultimate Positive Maneuvering Load Factor: | $n_{man_ult} = 5.25$ |
| Forward: | Ultimate Forward Emergency Landing Load Factor: | $n_{e_fwd} = 4$ |
| Sideward: | Ultimate Sideward Emergency Landing Load Factor: | $n_{e_side} = 2$ |
| Upward: | Ultimate Upward Emergency Landing Load Factor: | $n_{e_up} = 1.5$ |

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

5.1 Inertia Loads

$W_{\text{basket}} := 70 \text{ lbf}$ Weight of basket (including options, basic basket is less)

$W_{\text{cargo}} := 300 \text{ lbf}$ Weight of cargo (max)

$$P_{\text{man_lim}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_lim}}$$

$P_{\text{man_lim}} = 1295 \text{ lbf}$ Limit maneuvering load due to cargo and basket

$$P_{\text{man_ult}} := P_{\text{man_lim}} \cdot n_{\text{sf}}$$

$P_{\text{man_ult}} = 1943 \text{ lbf}$ Ultimate maneuvering load due to cargo and basket

$$P_{\text{man_lim_neg}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_neg}}$$

$P_{\text{man_lim_neg}} = -370 \text{ lbf}$ Limit negative maneuvering load due to cargo and basket

$$P_{\text{man_ult_neg}} := P_{\text{man_lim_neg}} \cdot n_{\text{sf}}$$

$P_{\text{man_ult_neg}} = -555 \text{ lbf}$ Ultimate negative maneuvering load due to cargo and basket

The negative maneuvering load factor is more critical than the upward emergency landing condition because it is combined with the drag load.

5.2 Drag Load

$l_{\text{basket}} := 96.5 \text{ in}$ Length of basket.

$w_{\text{basket}} := 25.5 \text{ in}$ Width of basket.

$h_{\text{basket}} := 18.5 \text{ in}$ Height of basket.

$A_f := 455 \text{ in}^2$ Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$A_p = 2461 \text{ in}^2$ Planar Area of basket.

$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.8$ Fineness ratio of basket

$C_{Do} := 1.1$ Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$ Density of air at Sea Level.

$V_{ne} := 155\text{-knots}$ Never-Exceed-Speed of Bell 429.
(Ref. Bell 429 Flight Manual.)

$V_d := \frac{V_{ne}}{0.9}$
 $V_d = 172\text{knots}$ Design Dive Speed of Bell 429

$P_{\text{drag_lim}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$
 $P_{\text{drag_lim}} = 349\text{lbf}$ Limit Drag load on basket.

$P_{\text{drag_ult}} := P_{\text{drag_lim}} \cdot n_{sf}$
 $P_{\text{drag_ult}} = 524\text{lbf}$ Ultimate Drag load on basket.

6.0 STRUCTURAL COMPLIANCE

Structural compliance is demonstrated by test. The cargo basket and mounting beams are tested. The attachment fittings are demonstrated by analysis in ER959.01. A jig simulating the helicopter attachments was fabricated. A pair of beams was fabricated in accordance with drawing 95930 and 95931. The beams were mounted on the jig, and a basket fabricated in accordance with drawing 95910 was installed on the beams.

The maneuvering load is applied by stacking bags of lead shot (25 lbs each) evenly over the bottom of the basket. The drag load is applied by pulling on a piece of plywood spanning the aft face of the basket with a come-along attached to a load cell.

6.1 Limit Positive Maneuvering Load

The lead shot required to apply the downward maneuvering load can be reduced by the weight of the basket body since it applies 1g down. The basket weighs 60 lbs.

$$P_{\text{man_lim_test}} := P_{\text{man_lim}} - 60\text{-lbf}$$

$P_{\text{man_lim_test}} = 1235\text{lbf}$ Limit load for test
(Basket weight 60 lbs as configured for test)

The basket was loaded with 50 bags of lead shot (1250 lbs total), and pulled 350 lbs.

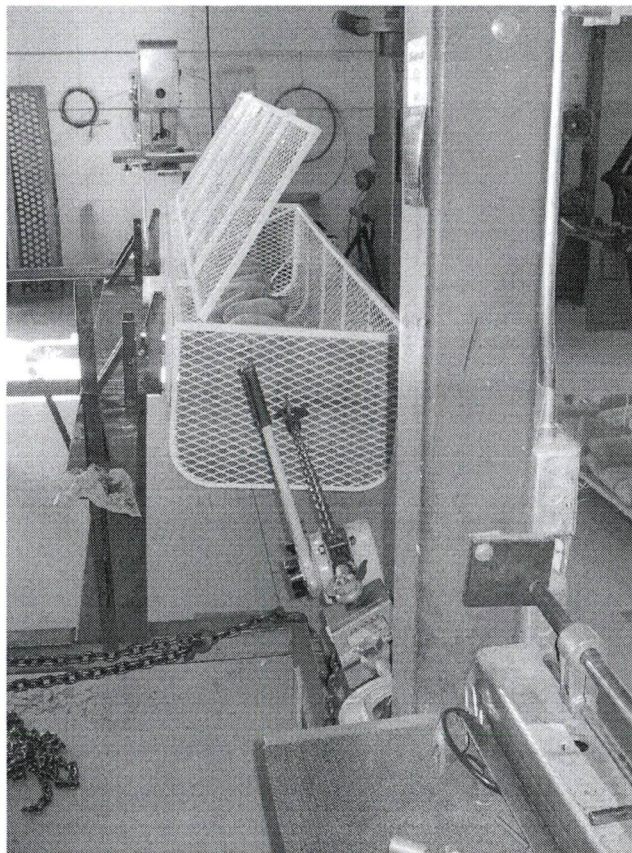


Figure 6.1.1 – Test Setup

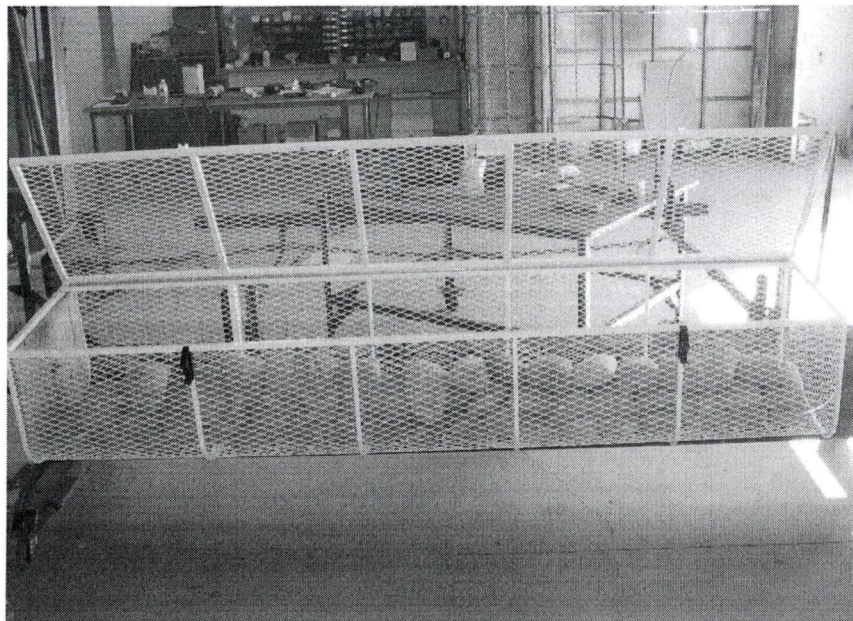


Figure 6.1.2 – Limit Maneuvering Load

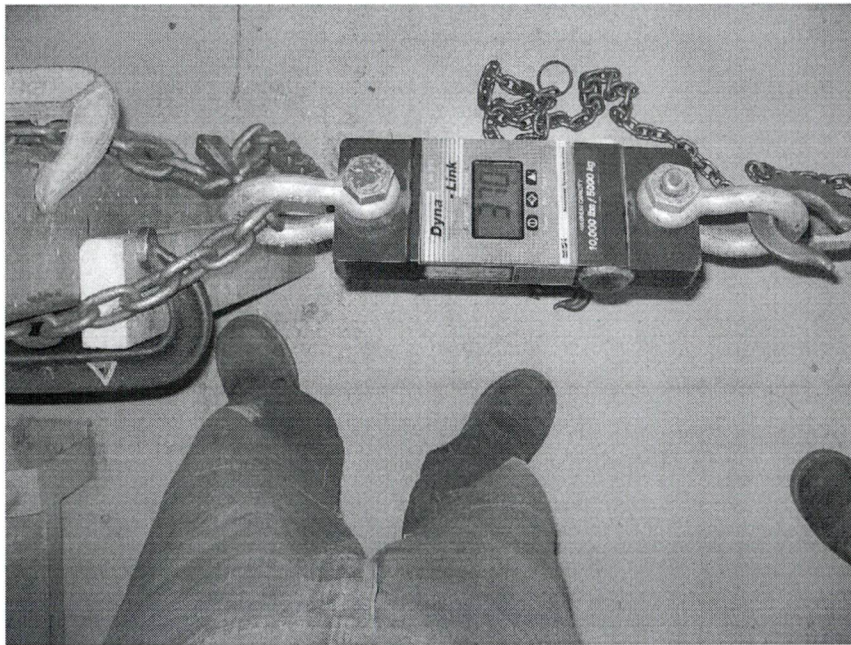


Figure 6.1.3 – Limit Drag Load (with Limit Maneuvering Load)

The loads were applied for more than 3 seconds. The loads were removed and the basket and beams checked for permanent deformation. There was no permanent deformation found.

6.2 Ultimate Positive Maneuvering Load

The lead shot required to apply the downward maneuvering load can be reduced by the weight of the basket since it applies 1g down. The basket body weighs 60 lbs.

$$P_{\text{man_ult_test}} := P_{\text{man_ult}} - 60 \cdot \text{lbf}$$

$$P_{\text{man_ult_test}} = 1883 \text{ lbf}$$

Ultimate load for test
(Basket weight 60 lbs as configured for test)

The basket was loaded with 76 bags of lead shot (1900 lbs), and pulled 430 lbs.

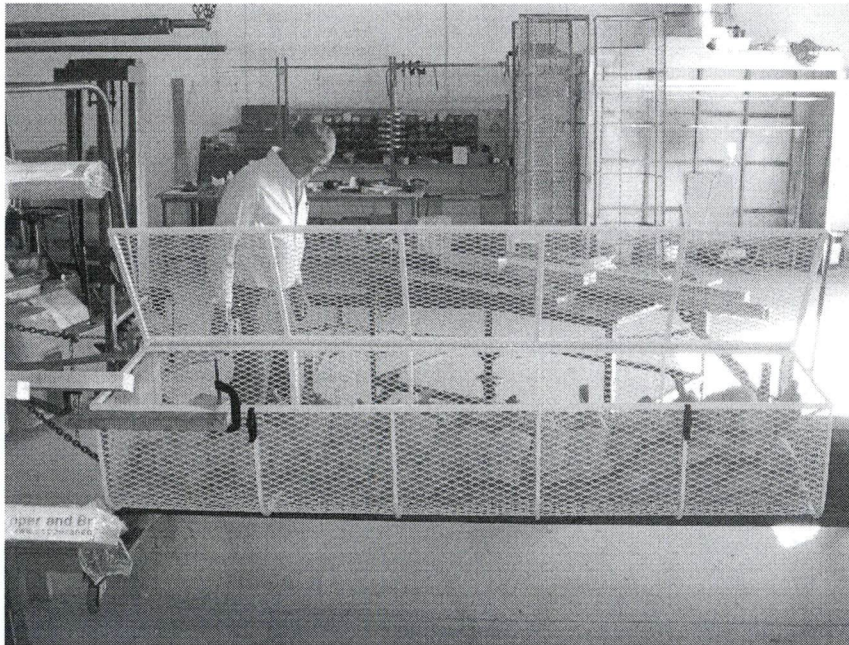


Figure 6.1.4 – Ultimate Maneuvering Load

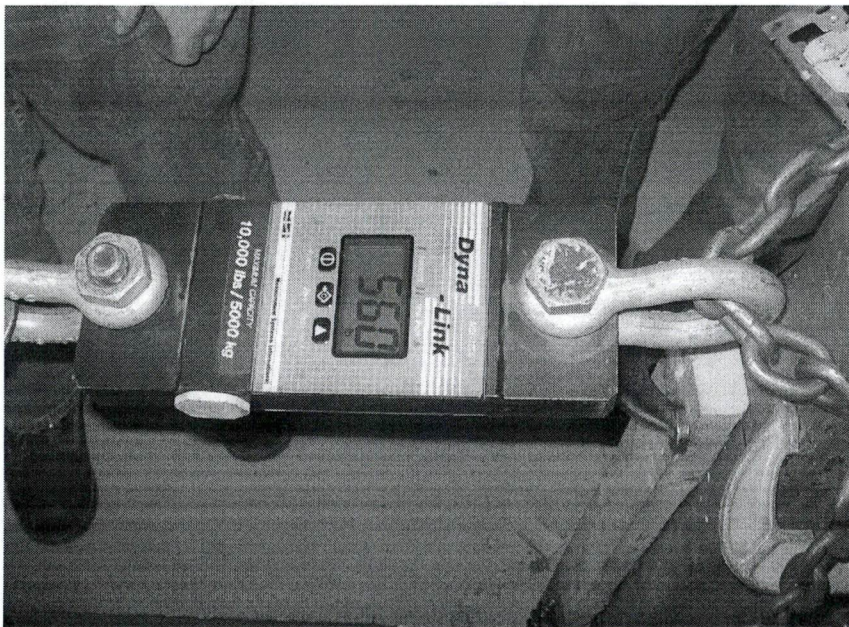


Figure 6.1.5 – Ultimate Drag Load (With Ultimate Maneuvering Load)

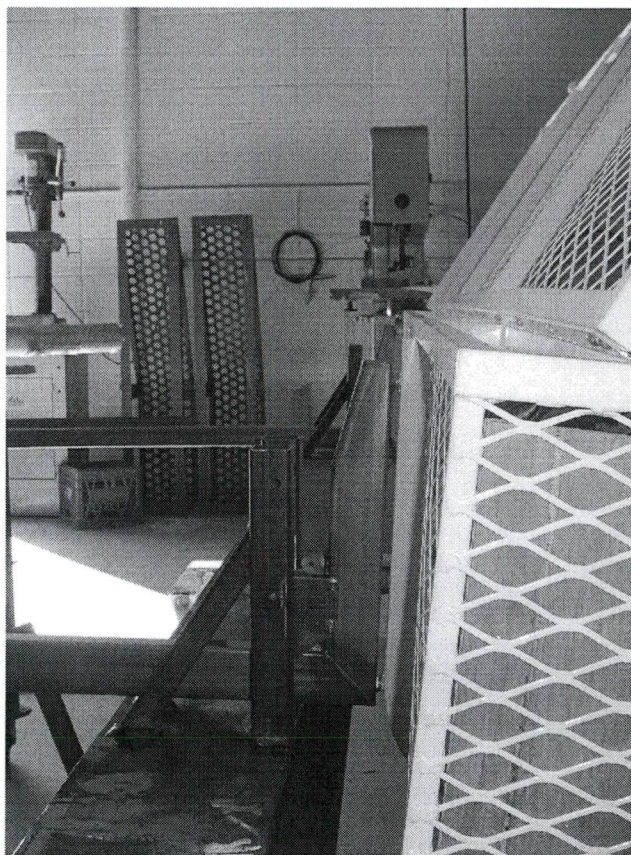


Figure 6.1.6 – Basket with Ultimate Maneuvering and Drag Loads

The basket and beams sustained the ultimate maneuvering and drag loads for more than 3 seconds without failure. The loads were removed and the basket and beams were checked for permanent deformation. There was no permanent deformation found in the mounting beams. The basket outboard rim was slightly deformed inboard, and had some areas of deformed mesh, but there were no broken welds or mesh. The latching mechanism for the lid still retains the handle.

6.3 Limit Negative Maneuvering Load

The lid has been demonstrated to remain closed under 450 lbs upward load, refer to ER842.01. As such, the basket and mounting beams may be installed upside down, and the load may be stacked directly on the bottom of the basket to demonstrate the negative maneuvering (upward) load. The lead shot required to apply the upward maneuvering load can be reduced by the weight of the basket body since it applies 1g down. The basket weighs 60 lbs.

$$P_{\text{man_lim_neg_test}} := P_{\text{man_lim_neg}}(-1) - 60 \cdot \text{lbf}$$

$$P_{\text{man_lim_neg_test}} = 310 \text{ lbf}$$

Limit load for test
(Basket weight 60 lbs as configured for test)

The basket was loaded with 13 bags of lead shot (325 lbs total), and pulled 350 lbs.

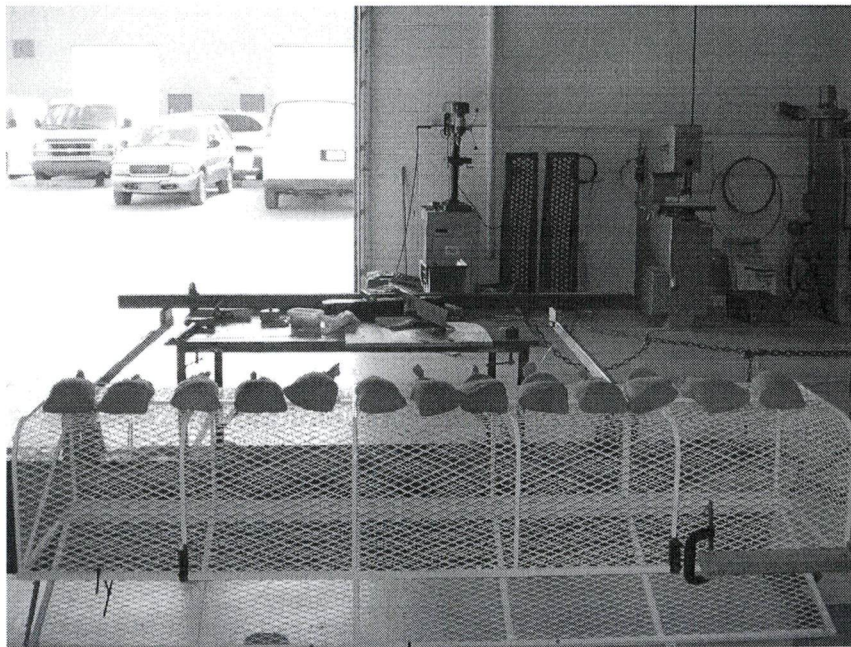


Figure 6.1.5 – Limit Negative Maneuvering Load

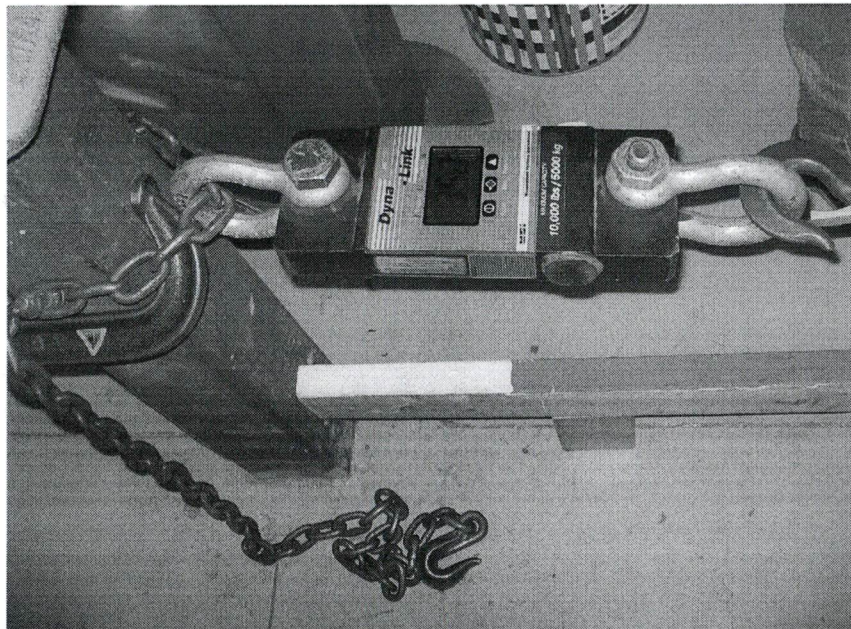


Figure 6.1.6 – Limit Negative Maneuvering and Drag Load

The loads were applied for more than 3 seconds. The deflection under load was minimal, so the test continued to ultimate load.

6.4 Ultimate Negative Maneuvering Load

The lead shot required to apply the downward maneuvering load can be reduced by the weight of the basket since it applies 1g down. The basket body weighs 60 lbs.

$$P_{\text{man_ult_neg_test}} := P_{\text{man_ult_neg}} \cdot (-1) - 60 \cdot \text{lbf}$$

$$P_{\text{man_ult_neg_test}} = 4951 \text{ lbf}$$

Ultimate load for test
(Basket weight 60 lbs as configured for test)

The basket was loaded with 20 bags of lead shot (500 lbs), and pulled 430 lbs.

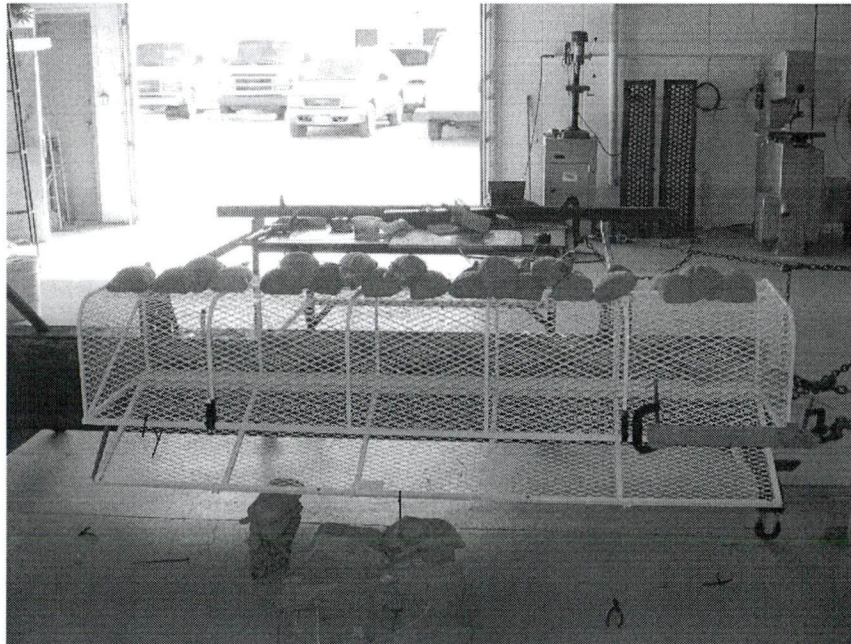


Figure 6.1.7 – Ultimate Negative Maneuvering Load

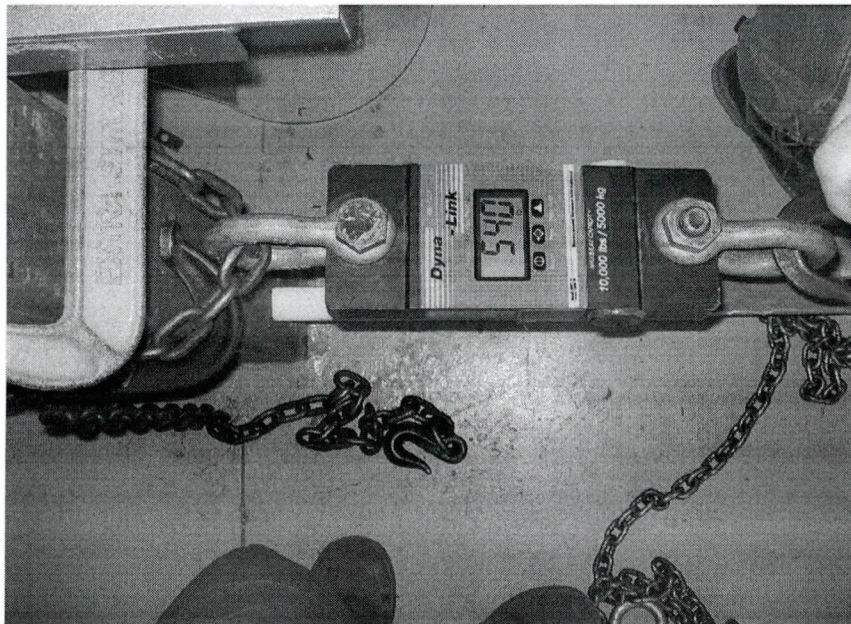


Figure 6.1.8 – Ultimate Negative Maneuvering and Drag Load

The basket and beams sustained the ultimate negative maneuvering and drag loads for more than 3 seconds without failure, and the basket did not release from the mounting beams. The assembly was taken apart and checked for permanent deformation and damage. There was a slight gouge in the head of the stop pin to retain the basket, but it did not affect retraction of the pin. There was no other permanent deformation or damage found.

6.5 Forward Emergency Landing Condition

The basket is located below the cabin. Forward deflection of the basket does not endanger the occupants in a crash.

6.6 Sideward Emergency Landing Condition

Sideward deflection of the basket does not endanger the occupants. The basket lid must remain closed in the sideward loading condition. The handle has been demonstrated to remain closed under 2g sideward load, reference Engineering Report ER842.01.

6.7 Upward Emergency Landing Condition

Upward deflection of the basket does not endanger the occupants. The basket lid must remain closed in the upward loading condition. The handle system has been demonstrated to remain closed under 450 lbs upward load (1.5g x 300 lbs), reference Engineering Report ER842.01.

62-8. Repair

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications and source.

| NUMBER | NOMENCLATURE |
|--------|-------------------------------|
| C-101 | Corrosion Preventive Compound |
| C-323 | Filler |
| C-326 | Alcohol |
| C-363 | Adhesive |
| C-411 | Steel Wool |
| C-423 | Abrasive Cloth or Paper |

1. Repairable nicks and scratches in leading-edge erosion strip (3, Figure 62-2) can be made smooth with an abrasive cloth or paper (C-423) or steel wool (C-411). Refer to BHT-427-CR&O for repair limits.

2. Filling permitted dents in leading edge erosion strip (3) or making permitted dents smooth with main rotor blade contour is not necessary.

3. Replace all corrosion preventive compound (C-101) that has worn away.

NOTE

Use care when installing new erosion tape to prevent bubbles under tape.

4. Deteriorated erosion tape (14, Figure 62-3) may be replaced using the following procedure:

- a. Remove existing erosion tape (14).
- b. Remove residual adhesive from existing erosion tape (14) using 220 sandpaper or scotchbrite pad sanding blade area.
- c. Clean sanded area with alcohol (C-326) and allow to dry.
- d. Brush apply a thin coat of 3M-86A adhesion promoter on blade area to receive new erosion tape (14) and allow to dry for 10 minutes.

e. Apply new erosion tape (14) as applicable.

5. Refer to the BHT-427-CR&O for more detailed repairs.

62-9. Installation

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications and source.

| NUMBER | NOMENCLATURE |
|--------|-------------------------------|
| C-101 | Corrosion Preventive Compound |
| C-104 | Corrosion Preventive Compound |

CAUTION

THE MAIN ROTOR HUB AND BLADE COMPONENTS ARE COLOR-CODED TO INDICATE POSITION. ALL COMPONENTS OF ONE COLOR REMOVED MUST BE INSTALLED IN THE SAME COLOR LOCATION.

NOTE

Only the installation procedure for one main rotor blade is given. The installation procedure is identical for the other three main rotor blades.

Lift the blade by hand only if a hoist is not available and only when two maintenance platforms are available.

1. Place sling (4, Figure 62-2) on hoist. Place hoist directly above the center of gravity (Figure 62-2) of main rotor blade assembly (3). Attach sling (4) straps around main rotor blade assembly (3).

2. Attach a rope to tiedown (5, Figure 62-2) at end of main rotor blade assembly (3). Use rope to control main rotor blade assembly (3) during hoisting operations.

PASSENGER STEP ASSEMBLIES

32-56. PASSENGER STEP ASSEMBLIES

The passenger step assemblies (2, Figure 32-1) are welded aluminum assemblies. They are installed on the left and right sides of the fuselage and provide a convenient means for the passengers to enter the cabin.

Each passenger step assembly consists of the parts that follow:

- Passenger step assembly
- Passenger step fitting assemblies
- Fairing assemblies

The passenger step assembly (10, Figure 32-18) is made of formed aluminum alloy tubing with three welded tubes. The welded tubes provide mounting points for the three passenger step fitting assemblies.

The passenger step fitting assemblies are made from aluminum alloy and are secured to the passenger step assemblies with riveted fasteners. The fitting assemblies are used to provide a mounting point to the fuselage structure.

The fairing assemblies are made up of a bonded cover assembly (5) and a bonded closeout panel (14) that are attached to the fitting assemblies with standard fasteners. Both parts incorporate rubber seals that fill any gaps between the fuselage and the passenger step assemblies.

32-57. PASSENGER STEP ASSEMBLIES — REMOVAL

NOTE

The procedure is provided for the passenger step assembly (10, Figure 32-18) on the left-hand side. The

procedure is the same for the passenger step assembly on the right-hand side.

1. Remove the cover assembly (5) and the closeout panel (14) at the location of the forward, middle, and aft fairing assemblies (1, 2, and 3) as follows:

a. Remove the screws (4 and 11) from the cover assembly (5).

b. Carefully remove the cover assembly (5) from the closeout panel (14).

c. For helicopters S/N 57001 through 57005, do as follows:

(1) At the location of the forward and middle fairing assemblies (1 and 2), remove the screw (12) and the closeout panel (14).

(2) At the location of the aft fairing assembly (3), remove the screw (12), washer (13), and closeout panel (14).

d. For helicopters S/N 57006 and subsequent, remove the screw (12) and the closeout panel (14) at the location of the forward, middle, and aft fairing assemblies (1, 2, and 3).

2. Remove the following panels to access the fitting assemblies of the passenger step assembly (10) on the applicable side (Chapter 53):

- Access cover, station 184.0 (300AL or 300AR)
- Access cover, station 224.0 (300BL or 300BR)

3. At three locations, remove the nut (6), washers (7 and 8), and bolt (9) from the fitting assembly of the passenger step assembly (10).

4. Remove the passenger step assembly (10) from the helicopter.

**32-58. PASSENGER STEP ASSEMBLIES —
CLEANING**
MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

| NUMBER | NOMENCLATURE |
|--------|-------------------|
| C-318 | Cleaning Compound |

1. Clean the passenger step assemblies (10, Figure 32-18) with a solution of cleaning compound (C-318) and water.
2. Rinse the passenger step assemblies (10) with water and allow to air dry.
3. Deleted.

**32-59. PASSENGER STEP ASSEMBLIES—
INSPECTION**
NOTE

The following inspection criteria are primarily intended when the part or component has been removed from the helicopter. To accommodate all inspection requirements, applicable criteria may also be used when the part or component is installed on the helicopter.

1. Visually examine the passenger step assemblies (10, Figure 32-18) for cracks, wear, mechanical damage, and corrosion damage (Figure 32-19). Repair or replace the part as required (paragraph 32-60).
2. Visually examine the fitting assemblies of the passenger step assembly (10) for cracks, wear, mechanical damage, and corrosion damage (Figure 32-20). Repair or replace the part as required (paragraph 32-60).
3. Visually examine the cover assemblies (5) and closeout panels (14) for wear, damage, and

delamination. If damage is found, refer to BHT-ALL-SRM, Chapter 4 for repair. Repairs can be done by wet lay-up using any suitable epoxy resin and fiberglass or carbon fabric.

4. Visually examine the attaching hardware for cracks, wear, mechanical damage, and corrosion damage. Replace as required.

**32-60. PASSENGER STEP ASSEMBLIES —
REPAIR**
MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

| NUMBER | NOMENCLATURE |
|--------|------------------------|
| C-100 | Chemical Film Material |
| C-202 | Epoxy Primer |
| C-204 | Epoxy Polyamide primer |
| C-223 | Nonslip Compound |
| C-245 | Polyurethane Coating |

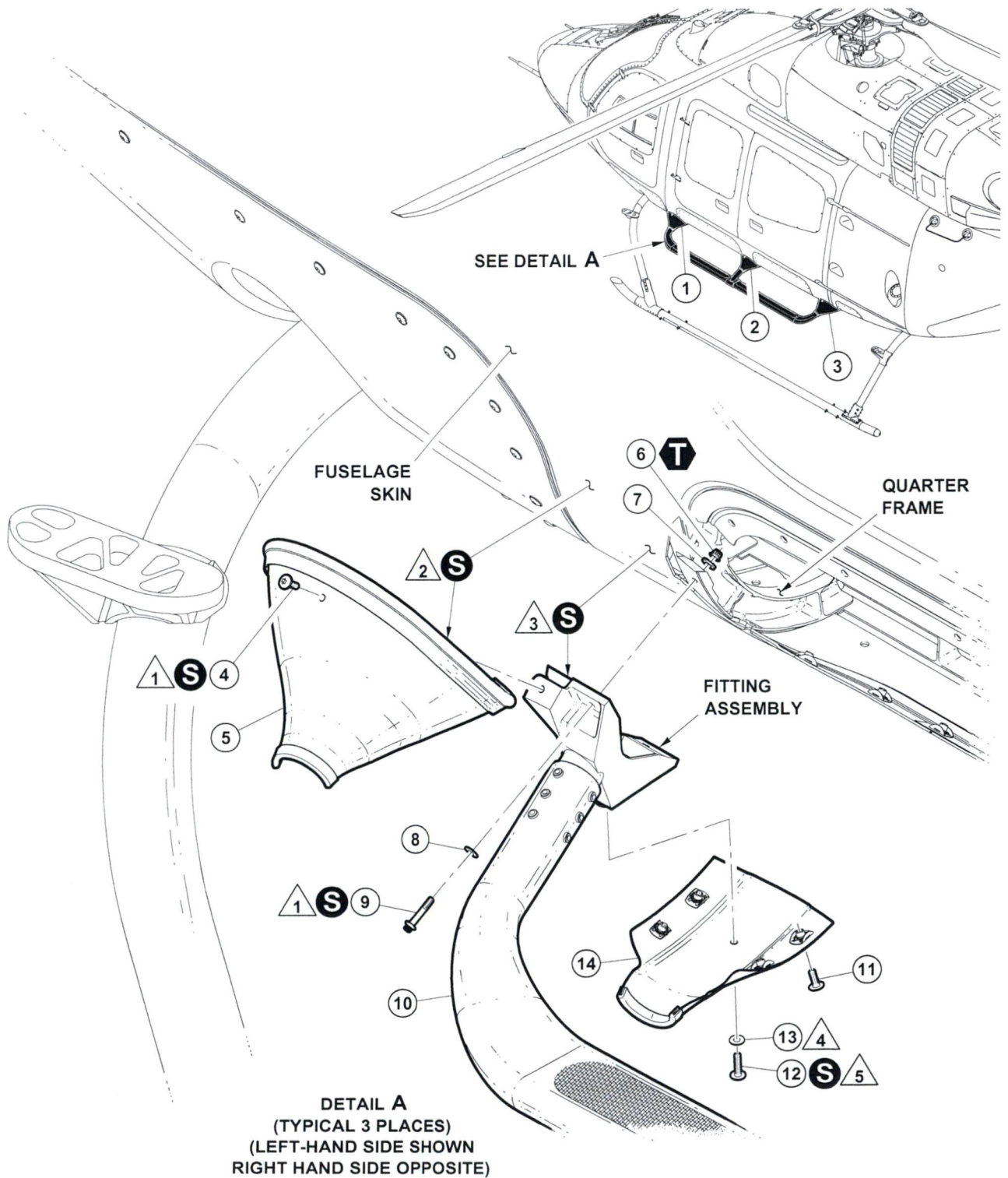
1. If there is evidence of mechanical damage and/or corrosion damage to the passenger step assemblies (10, Figure 32-18), refer to Figure 32-19 for information on the applicable repair.

2. If there is evidence of mechanical damage and/or corrosion damage to the fitting assemblies of the passenger step assembly (10), refer to Figure 32-20 for information on the applicable repair.

3. Deleted.

4. Refinish the passenger step assembly (10) as follows:

- a. Apply chemical film material (C-100) to the repaired area (BHT-ALL-SPM, Chapter 3).



429_MM_32_0020_c01

Figure 32-18. Passenger Step Assembly — Removal and Installation (Sheet 1 of 2)

1. Forward fairing assembly
2. Middle fairing assembly
3. Aft fairing assembly
4. Screw
5. Cover assembly
6. Nut
7. Washer
8. Washer
9. Bolt
10. Passenger step assembly
11. Screw
12. Screw
13. Washer
14. Closeout panel

S SEALANT (C-251)

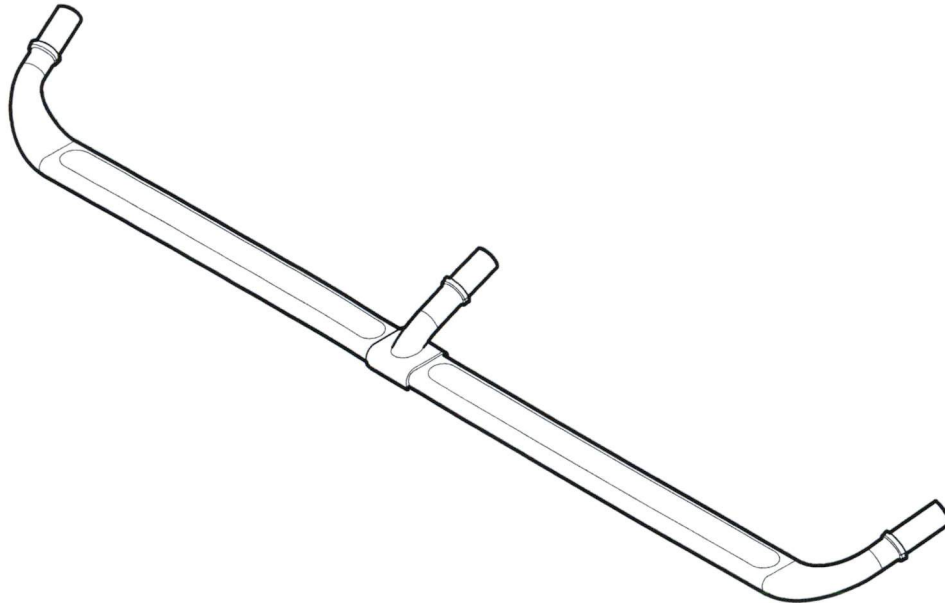
T 20 TO 25 IN-LBS
(2.3 TO 2.8 Nm)

NOTES



- 1 Overcoat the fasteners with sealant (C-251) after installation.
- 2 Apply sealant (C-251) to the faying surfaces of the cover assembly (5) and the fuselage skin.
- 3 Apply sealant (C-251) to the faying surfaces of the fitting assembly and the fuselage skin.
- 4 For helicopters S/N 57001 through 57005, the washer (13) is installed on the aft fairing assembly (3) only.
- 5 For helicopters S/N 57001 through 57005, overcoat the screw (12) with sealant (C-251) after installation.

429_MM_32_0030_c01



Figure 32-18. Passenger Step Assembly — Removal and Installation (Sheet 2 of 2)



PASSENGER STEP (429-030-075)
MATERIAL: ALUMINUM

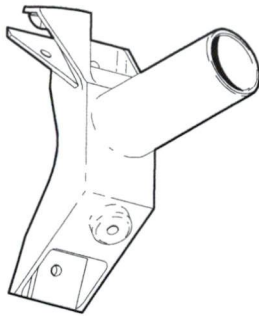
| NO. | REF LTR | CHARACTERISTIC | INSPECTION METHOD | LIMIT | |
|-----|------------|--------------------------------|----------------------|--|---|
| 1. | | Mechanical/corrosion damage | Visual/measure | 0.010 inch (0.25 mm) maximum depth. |  |
| 2. | | Smooth dents | Visual/measure | 0.020 inch (0.51 mm) maximum depth. |  |
| 3. | | Cracks | Visual | None permitted. | |

NOTES

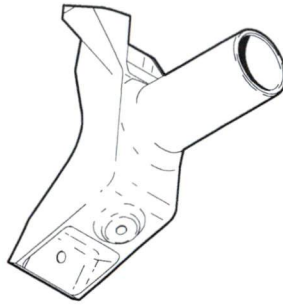
-  To repair the damage, blend smooth and refinish (BHT-ALL-SPM).
-  Do not refinish, use as is.
3. All dimensions, wear, and damage limits provided are limits required after repair except where indicated.

429_MM_32_0044

Figure 32-19. Passenger Step Assembly — Wear, Damage, and Repair Limits



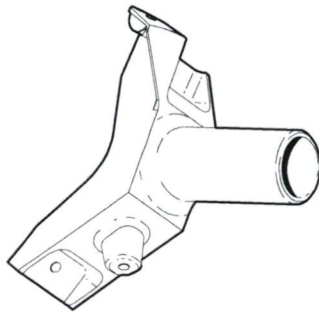
-101, -102



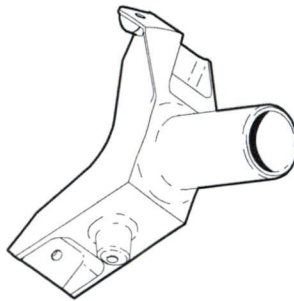
-103, -104



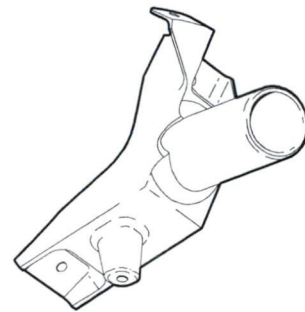
-105, -106



-107, -108



-109, -110



-111, -112

FITTING ASSEMBLY, PASSENGER STEP (429-030-076)
 MATERIAL: ALUMINUM

| NO. | REF LTR | CHARACTERISTIC | INSPECTION METHOD | LIMIT |
|-----|------------|--------------------------------|----------------------|--|
| 1. | | Mechanical/corrosion damage | Visual/measure | 0.010 inch (0.25 mm) maximum depth. |
| 2. | | Cracks | Visual | None permitted. |

1

NOTES

- 1 To repair the damage, blend smooth and refinish (BHT-ALL-SPM).
2. All dimensions, wear, and damage limits provided are limits required after repair except where indicated.
3. Limits also apply to all successive dash numbers for the component.

429_MM_32_0042

Figure 32-20. Passenger Step Fitting Assemblies — Wear, Damage, and Repair Limits

b. Apply a coating of epoxy primer (C-202) or epoxy polyamide primer (C-204) to the repaired area (BHT-ALL-SPM, Chapter 4).

c. Apply two to three coats of polyurethane coating (C-245) to the repaired area (BHT-ALL-SPM, Chapter 4).

d. If necessary, apply a nonslip compound (C-223) to the top surface of the passenger step assemblies.

32-61. PASSENGER STEP ASSEMBLIES — INSTALLATION

MATERIALS REQUIRED

Refer to BHT-ALL-SPM for specifications.

| NUMBER | NOMENCLATURE |
|--------|--------------|
| C-251 | Sealant |

NOTE

The procedure is provided for the passenger step assembly (10, Figure 32-18) on the left-hand side. The procedure is the same for the passenger step assembly on the right-hand side.

1. Install the passenger step assembly (10) as follows:

a. At the location of the forward and aft fairing assemblies (1 and 3), make sure the faying surfaces of the washers (7 and 8), fitting assembly, and fuselage skin are clean and prepared for bonding. Otherwise, refer to the BHT-ELEC-SPM, Chapter 8.

b. At three locations, apply sealant (C-251) to the faying surfaces of the fitting assembly and the fuselage skin.

c. Apply sealant (C-251) to the shanks of the bolts (9). Do not apply sealant to the bolt threads.


NOTE

A gentle force may be required to position the passenger step assembly (10).

d. Position the passenger step assembly (10) on the fuselage skin.

e. While sealant is wet, install the bolt (9), washers (7 and 8), and nut (6) at three locations.

f. At the location of the forward and aft fairing assembly (1 and 3), make sure the bond resistance between the bolt (9) and the quarter frame is less than 1000 milliohms (BHT-ELEC-SPM, Chapter 8).

g. Torque the nut (6) .

h. Overcoat the fasteners with sealant (C-251).

2. Install the following panels (Chapter 53):

- Access cover, station 184.0 (300AL or 300AR)
- Access cover, station 224.0 (300BL or 300BR)

3. Install the cover assembly (5) and the closeout panel (14) at the location of the forward, middle, and aft fairing assemblies (1, 2, and 3) as follows:

a. For helicopters S/N 57001 through 57005, do as follows:

(1) Position the closeout panel (14) under the fitting assembly of the passenger step assembly (10).

(2) Apply sealant (C-251) to the screw (12).

(3) At the location of the aft fairing assembly (3), install the screw (12) and the washer (13) on the closeout panel (14) while sealant is wet. Tighten the screw.

(4) At the location of the forward and middle fairing assemblies (1 and 2), install the screw (12) on the closeout panel (14) while sealant is wet. Tighten the screw.

(5) Overcoat the screw (12) with sealant (C-251).

b. For helicopters S/N 57006 and subsequent, do as follows:

(1) Position the closeout panel (14) under the fitting assembly of the passenger step assembly (10).

(2) Apply sealant (C-251) to the screw (12).

(3) While sealant is wet, install the screw (12) on the closeout panel (14). Tighten the screw.

c. Apply sealant (C-251) to the faying surfaces of the cover assembly (5) and the fuselage skin.

d. Position the cover assembly (5) on the closeout panel (14) and the fitting assembly of the

passenger step assembly (10). Make sure the cover assembly is in contact with the fuselage skin.

e. Apply sealant (C-251) to the screw (4).

f. Install the screws (4 and 11) on the cover assembly (5). Tighten the screws.

g. Overcoat the screw (4) with sealant (C-251).

24

23

429-030-530

AFF

SEE SECTION K-K ZN A/27
FOR CALLOUT AND LOCATION

J YCT 5
5
.36 EDGE DISTANCE
TO 429-030-471

J YDK 5
5
.36 EDGE DISTANCE
TO 429-030-471 REF

(B1) Ø.198 HOLE
Ø.193
MATCH WITH
429-030-076

BL
21.015
REF

429-030-471 REF

FOR F
LOCAT4 EQ
SPACES3 EQ
SPACES.36 EDGE DISTANCE
TO 429-030-478

429-030-478 REF

429-030-471 REF

FOR FASTENER
LOCATION SEE

DMG NO 430-030-230 SH NO 5

D

C

429-030-543 REF

VIEW LOOKING FORWARD AT AFT FLANGE OF
BULKHEAD 429-030-308 & 429-030-342
FOR FASTENER LOCATIONS ONLY

J1

429-030-302 REF

BL
21.185
REF

J YDK 5
.36 EDGE DISTANCE
TO 429-030-465
EXCEPT AS NOTED

429-030-566 REF

TRACE
WL
22.645
REF

SEE VIEW
FOR CALLOUT AND

J .47 EDGE DISTANCE
TO 429-030-472 F
EXCEPT AS NOTED

DISTANCE
TO 429-030-313
EXCEPT AS NOTED

F .20

429-030-465 REF

8 EQ
SPACES

F .20

B1

Ø.198
Ø.193 HOLE
MATCH WITH
429-030-076

7 EQ
SPACES

SEE SECTION K-K ZN A/27
FOR CALLOUT AND LOCATION

B1

J YDK 5

.36 EDGE DISTANCE
TO 429-030-465
EXCEPT AS NOTED

3 EQ
SPACES

F .38

DISTANCE
TO 429-030-313

F .37

5 EQ
SPACES

F .25

3 EQ
SPACES

J YDK 5

.36 EDGE DISTANCE
TO 429-030-465
EXCEPT AS NOTED

J

F .20

UP
OUTBD

SECTION B-B A/7

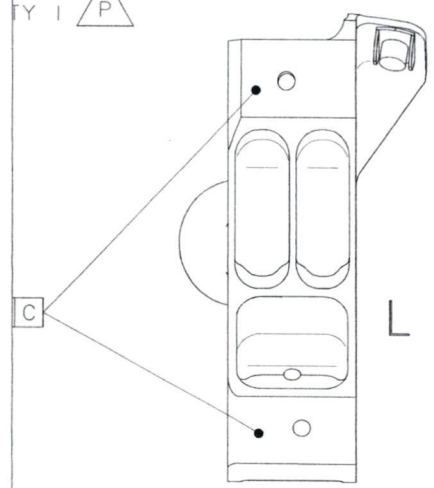
VIEW LOOKING FORWARD NORMAL
TO QUARTER FRAME

B1 Ø.198
Ø.193 HOLE
MATCH WITH
429-030-076

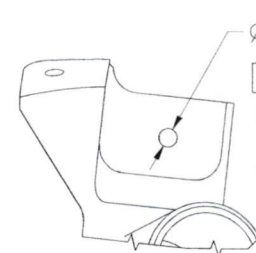
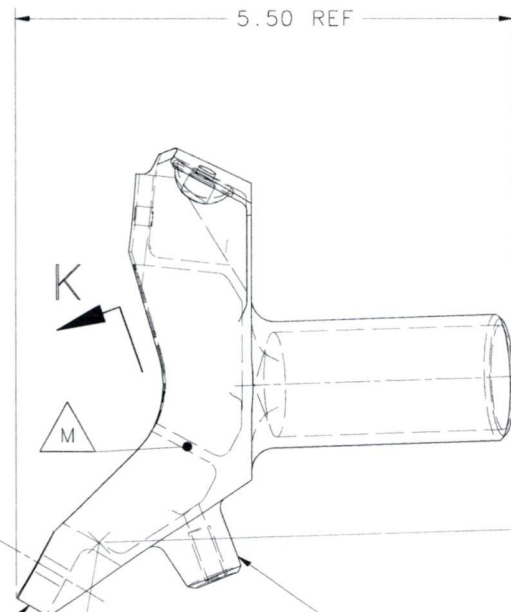
FWD

L B16

TY I P



L



Ø .208
Ø .203
⊕ Ø.007(M) A B C
MATCH WITH
429-030-530

5.1
REF

FITTING - SHN -121

FITTING - OPP -122

A1

A1

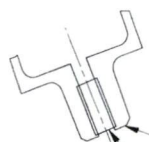
C1

(-107) FITTING ASSY - SHN

(-108) FITTING ASSY - OPP

K A15

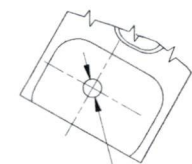
429-030-076



SURFACE
⌒ .005 A B C

MS124815 INSERT COIL
INSERT THD THRU PER MS33537
INSTALL INSERT .75-1.5 TURNS
BELOW SURFACE
REMOVE TANG

⊕ Ø.015(M) A B C



Ø .208
Ø .203
⊕ Ø.007(M) A B C
MATCH WITH
429-030-530

SECTION K-K A15

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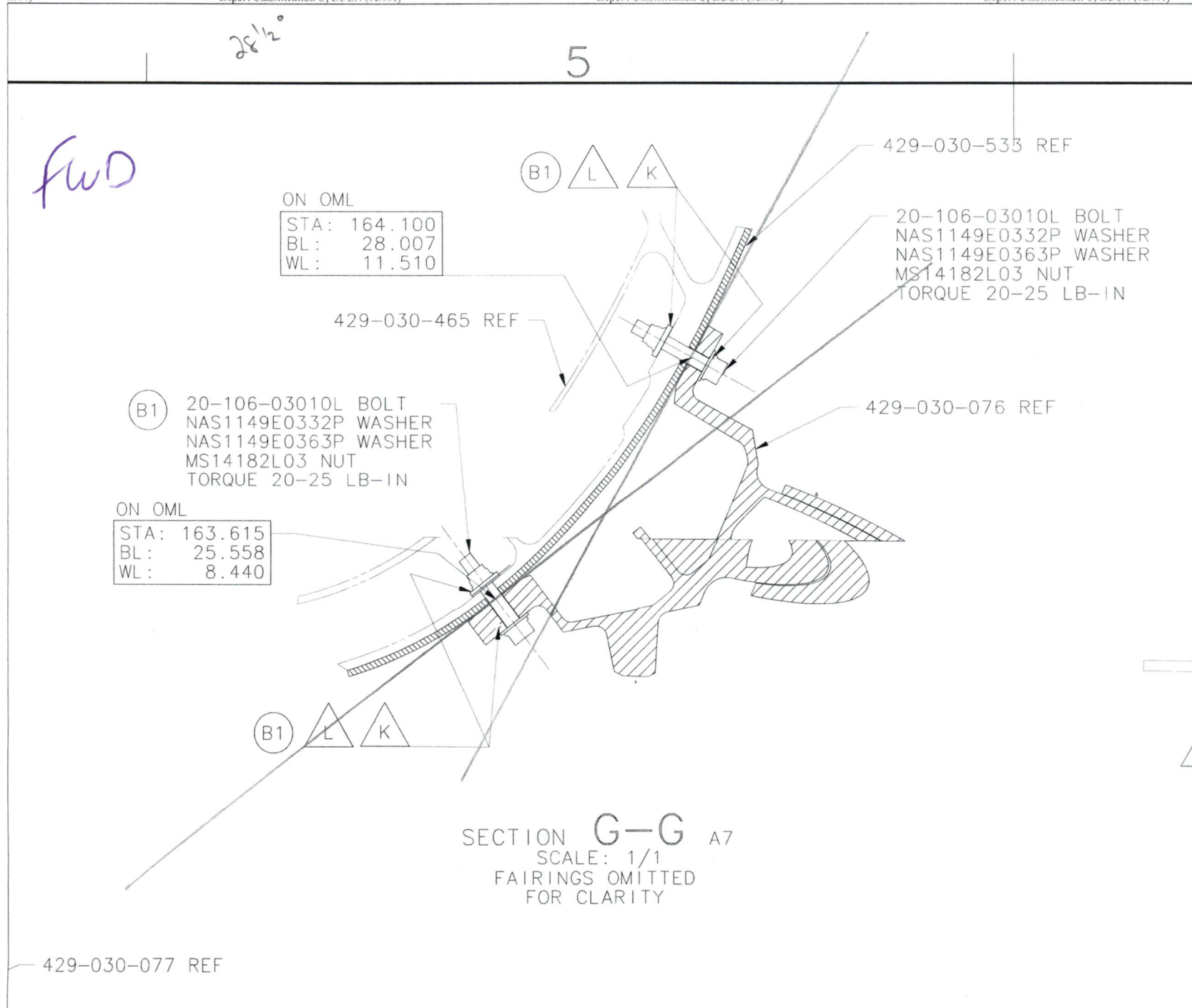
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E991)

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Export Classification C, ECCN (9E991)

Export Classification C, ECCN (9E991)





20-106-03010L BOLT
 NAS1149E0332P WASHER
 NAS1149E0363P WASHER
 MS14182L03 NUT
 TORQUE 20-25 LB-IN

SECTION H-H A6
 SCALE: 1/1
 FAIRINGS OMITTED
 FOR CLARITY

ART

ON OML

STA: 238.985
 BL: 27.537
 WL: 11.550

(B1)



429-030-471 REF

ON OML

STA: 238.530
 BL: 24.727
 WL: 8.694

(B1)

20-106-03010L BOLT
 NAS1149E0332P WASHER
 NAS1149E0363P WASHER
 MS14182L03 NUT
 TORQUE 20-25 LB-IN



(B1)

SECTION J-J A4
 SCALE: 1/1
 FAIRINGS OMITTED
 FOR CLARITY

J

429-030-077-105 FAIRING SHOWN

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 ve 5230.25.

429-030-471 REF

20-106-03010L BOLT
 NAS1149E0332P WASHER
 NAS1149E0363P WASHER
 MS14182L03 NUT
 TORQUE 20-25 LB-IN

429-030-471 REF

NSG
AUTOMATECH

Client BELLEHELIUM PEXTRON
PO# 450024836
part# 429-030-108-10
desc FITTING
qty 1 JOB: 1120
mtg date 06/10/2011 V/C 091900
CHG 00

DRAG LOAD ON BASKET

$$l_{\text{basket}} := 96.5 \cdot \text{in}$$

Length of basket.

$$w_{\text{basket}} := 25.5 \cdot \text{in}$$

Width of basket.

$$h_{\text{basket}} := 18.5 \cdot \text{in}$$

Height of basket.

$$A_f := 455 \cdot \text{in}^2$$

Frontal Area of basket.

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

Planar Area of basket.

$$A_p = 2461 \text{ in}^2$$

$$\frac{l_{\text{basket}}}{w_{\text{basket}}} = 3.8$$

Fineness ratio of basket

$$C_{Do} := 1.1$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \cdot \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 155 \cdot \text{knots}$$

Never-Exceed-Speed of Bell ⁴²⁹407.
(Ref. Bell 407 Flight Manual.)

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 172 \text{ knots}$$

Design Dive Speed of Bell ⁴²⁹407

$$P_{\text{drag_lim}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_f \cdot C_{Do}$$

$$P_{\text{drag_lim}} = 349 \text{ lbf}$$

Limit Drag load on basket.

$$P_{\text{drag_ult}} := P_{\text{drag_lim}} \cdot n_{sf}$$

$$P_{\text{drag_ult}} = 524 \text{ lbf}$$

Ultimate Drag load on basket.

Quick Release Cargo Basket - XL Long

$$W_{\text{basket}} := 70 \cdot \text{lbf}$$

Weight of basket (including options, basic basket is less).

$$W_{\text{cargo}} := 300 \cdot \text{lbf}$$

Weight of cargo (max)

$$P_{\text{man_lim}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_lim}}$$

$$P_{\text{man_lim}} = 1295 \text{ lbf}$$

Limit maneuvering load due to cargo and basket

$$P_{\text{man_ult}} := P_{\text{man_lim}} \cdot n_{\text{sf}}$$

$$P_{\text{man_ult}} = 1943 \text{ lbf}$$

Ultimate maneuvering load due to cargo and basket

$$P_{\text{man_lim_test}} := P_{\text{man_lim}} - 60 \cdot \text{lbf}$$

$$P_{\text{man_lim_test}} = 1235 \text{ lbf}$$

Limit load for test
(Basket weight 60 lbs as configured for test)

50 bags
(1250 lb)

$$P_{\text{man_ult_test}} := P_{\text{man_ult}} - 60 \cdot \text{lbf}$$

$$P_{\text{man_ult_test}} = 1883 \text{ lbf}$$

Ultimate load for test
(Basket weight 60 lbs as configured for test)

76 bags
(1900 lb)

Fwd load

$$(300 + 70) \times 4 = 1480 \text{ lb.}$$

ultimate fwd (no limit)
emerg landing cond.

Up load

1.5g ult emerg load

$$370 = 1.0g \text{ lim}$$

$$555 = 1.5g \text{ ult}$$

maneuvering
maneuvering

comb. w/drag.

128 bags
5650 lb

Aft \longleftrightarrow (●)

Ø 39 $\frac{1}{4}$ 39 $\frac{1}{8}$

LIM 38 $\frac{1}{8}$ 36 $\frac{3}{4}$

Ø 39 $\frac{1}{4}$ 38 $\frac{7}{8}$

ULT No measure

Ø 39 $\frac{1}{8}$ 38 $\frac{3}{4}$

Slight bow on aft beam
less than $\frac{1}{32}$

DEFLECTION MUST BE SHIFTING
IN WHOLE ASSY

MINOR DEFORMATION C ULT
NO FAILURE

$$W_{\text{basket}} := 70 \cdot \text{lbf}$$

Weight of basket (including options, basic basket is less)

$$W_{\text{cargo}} := 300 \cdot \text{lbf}$$

Weight of cargo (max)

$$P_{\text{man_lim}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_lim}}$$

$$P_{\text{man_lim}} = 1295 \text{ lbf}$$

Limit maneuvering load due to cargo and basket

$$P_{\text{man_ult}} := P_{\text{man_lim}} \cdot n_{\text{sf}}$$

$$P_{\text{man_ult}} = 1943 \text{ lbf}$$

Ultimate maneuvering load due to cargo and basket

$$P_{\text{man_lim_test}} := P_{\text{man_lim}} - 60 \cdot \text{lbf}$$

$$P_{\text{man_lim_test}} = 1235 \text{ lbf}$$

Limit load for test
(Basket weight 60 lbs as configured for test)

$$P_{\text{man_ult_test}} := P_{\text{man_ult}} - 60 \cdot \text{lbf}$$

$$P_{\text{man_ult_test}} = 1883 \text{ lbf}$$

Ultimate load for test
(Basket weight 60 lbs as configured for test)

$$P_{\text{man_lim_neg}} := (W_{\text{basket}} + W_{\text{cargo}}) \cdot n_{\text{man_neg}}$$

$$P_{\text{man_lim_neg}} = -370 \text{ lbf}$$

Limit maneuvering load due to cargo and basket

$$P_{\text{man_ult_neg}} := P_{\text{man_lim_neg}} \cdot n_{\text{sf}}$$

$$P_{\text{man_ult_neg}} = -555 \text{ lbf}$$

Ultimate maneuvering load due to cargo and basket

$$P_{\text{man_lim_neg_test}} := P_{\text{man_lim_neg}} \cdot (-1) - 60 \cdot \text{lbf}$$

$$P_{\text{man_lim_neg_test}} = 310 \text{ lbf}$$

Limit load for test
(Basket weight 60 lbs as configured for test)

$$P_{\text{man_ult_neg_test}} := P_{\text{man_ult_neg}} \cdot (-1) - 60 \cdot \text{lbf}$$

$$P_{\text{man_ult_neg_test}} = 495 \text{ lbf}$$

Ultimate load for test
(Basket weight 60 lbs as configured for test)

325 lb
13 bags limit

500 lb
20 bags ult

Emergency Landing Conditions

527.561 General

(a) The rotorcraft, although it may be damaged in emergency landing conditions on land or water, must be designed as prescribed in this section to protect the occupants under those conditions.

(b) The structure must be designed to give each occupant every reasonable chance of escaping serious injury in a crash landing when:

- (1) Proper use is made of seats, belts, and other safety design provisions;
- (2) The wheels are retracted (where applicable); and
- (3) Each occupant and each item of mass inside the cabin that could injure an occupant is restrained when subjected to the following ultimate inertial load factors relative to the surrounding structure:
 - (i) Upward - 4g.
 - (ii) Forward - 16g.
 - (iii) Sideward - 8g.
 - (iv) Downward - 20g, after intended displacement of the seat device.
 - [(v) Rearward - 1.5g.]

(c) The supporting structure must be designed to restrain, under any ultimate inertial load up to those specified in this paragraph, any item of mass above and/or behind the crew and passenger compartment that could injure an occupant if it came loose in an emergency landing. Items of mass to be considered include, but are not limited to, rotors, transmissions, and engines. The items of mass must be restrained for the following ultimate inertial load factors:

- (1) Upward - 1.5g.
- (2) Forward - [12g.]
- (3) Sideward - [6g.]
- (4) Downward - [12g.]
- (5) Rearward - [1.5g.]

[(d) Any fuselage structure in the area of internal fuel tanks below the passenger floor level must be designed to resist the following ultimate inertial factors and loads and to protect the fuel tanks from rupture when those loads are applied to that area:

- [(i) Upward - 1.5g. - 1st / handle demonstrated §42
- [(ii) Forward - 4.0g.
- [(iii) Sideward - 2.0g. - handle demonstrated §42
- [(iv) Downward - 4.0g.] - Maneuvering demonstrated

(Change 527-2 (92-02-01))

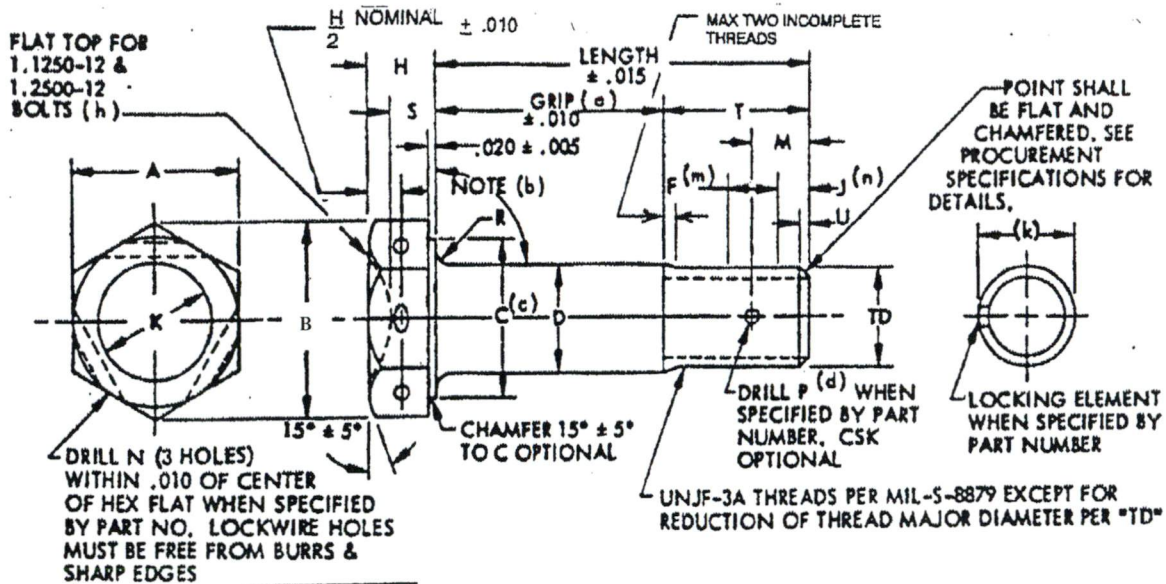
(Change 527-3 (94-01-03))

(Change 527-4)

AVIAQUIP

NAS6603 THRU NAS6620

BOLT, HEX HEAD, CLOSE TOLERANCE, ALLOY STEEL, LONG THREAD
SELF-LOCKING & NON LOCKING



HEAD MARKINGS : Basic number
plus grip dash number plus "D"

"L" or "P" when applicable plus manufacturer's symbol
Raised or depressed .010 max. Arrangement optional
"D" identifies bolt with drilled shank
"L" identifies bolt with optional locking elements

| BASIC NUMBER | THREAD | A | | B MIN | C DIA MIN | D DIAMETER | | | | "H" +.015 -.000 | "T" REF | "TD" DIA | |
|-----------------|-----------|-------|-------|----------|-----------------|-----------------|--------|----------------|--------|-----------------------|------------|-------------|-------|
| | | | | | | BEFORE PLATE | | AFTER PLATE | | | | | |
| | | MAX | MIN | | | MAX | MIN | MAX | MIN | | | | |
| NAS6603 | .1900-32 | .376 | .367 | .410 | .335 | .1850 | .1845 | .1895 | .1885 | .110 | .345 | .184 | .181 |
| NAS6604 | .2500-28 | .439 | .429 | .480 | .398 | .2450 | .2445 | .2495 | .2485 | .125 | .425 | .244 | .241 |
| NAS6605 | .3125-24 | .502 | .492 | .552 | .460 | .3075 | .3070 | .3120 | .3110 | .156 | .469 | .306 | .302 |
| NAS6606 | .3750-24 | .564 | .554 | .623 | .523 | .3700 | .3695 | .3745 | .3735 | .188 | .578 | .368 | .364 |
| NAS6607 | .4375-20 | .690 | .678 | .764 | .648 | .4325 | .4320 | .4370 | .4360 | .219 | .694 | .431 | .426 |
| NAS6608 | .5000-20 | .752 | .741 | .836 | .710 | .4950 | .4645 | .4995 | .4985 | .250 | .735 | .493 | .488 |
| NAS6609 | .5625-18 | .877 | .865 | .978 | .835 | .5570 | .5565 | .5615 | .5605 | .281 | .840 | .555 | .550 |
| NAS6610 | .6250-18 | .940 | .928 | 1.050 | .898 | .6195 | .6190 | .6240 | .6230 | .312 | .902 | .618 | .612 |
| NAS6612 | .7500-16 | 1.065 | 1.052 | 1.191 | 1.023 | .7445 | .7440 | .7490 | .7480 | .375 | 1.041 | .743 | .737 |
| NAS6614 | .8750-14 | 1.252 | 1.239 | 1.405 | 1.210 | .8695 | .8690 | .8740 | .8730 | .438 | 1.184 | .868 | .861 |
| NAS6616 | 1.0000-12 | 1.440 | 1.427 | 1.619 | 1.398 | .9945 | .9940 | .9990 | .9980 | .500 | 1.309 | .993 | .986 |
| NAS6618 | 1.1250-12 | 1.627 | 1.614 | 1.832 | 1.585 | 1.1195 | 1.1195 | 1.1240 | 1.1225 | .562 | 1.458 | 1.118 | 1.111 |
| NAS6620 | 1.2500-12 | 1.814 | 1.801 | 2.046 | 1.772 | 1.2445 | 1.2445 | 1.2490 | 1.2475 | .625 | 1.646 | 1.243 | 1.236 |

MATERIAL : ALLOY STEEL - 4140, 4340, E4340 or 8740.

Locking element - plastic per MIL-F-18240 and CPL18240

HEAT TREAT : 160-180 KSI Flu; 95 KSI min ultimate shear per MIL-H-6875.

FINISH: Cadmium Plate per QQ-P-416 Type 11 Class 2

Embrittlement requirements per NAS4002

CHROMIUM PLATED BOLTS : Chromium Plate per QQ-C-320 class 2 *on shank only* - all other surfaces cadmium plated. Chromium in thread run-out permitted. Chromium plated bolts not available with grip 1 or number 2.

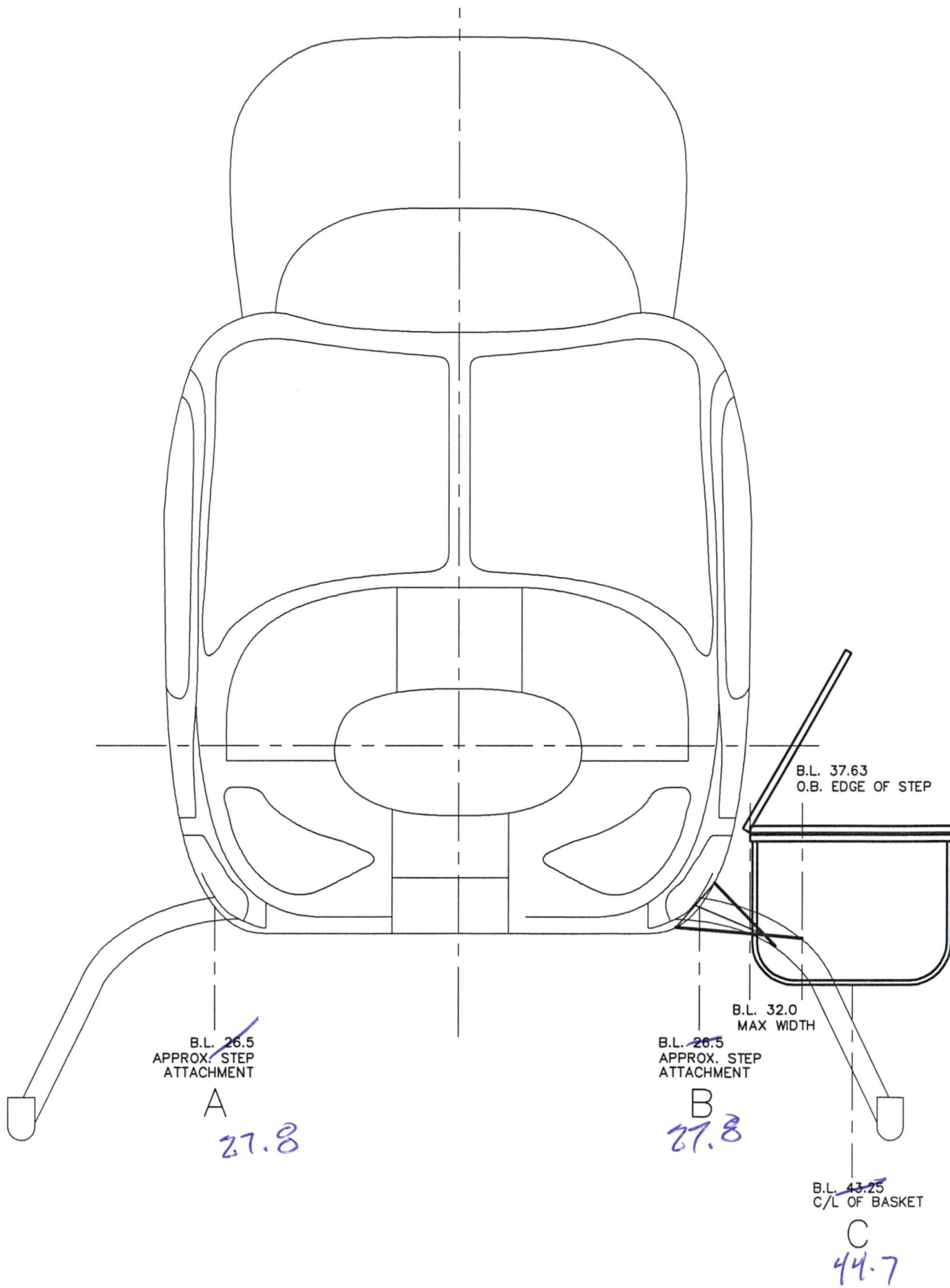
EXAMPLES OF PART NUMBERS :

NAS6604-10 Bolt .2500-28 thread .625 grip undrilled non-locking cadmium plated

NAS6604D10 .2500-28 thread .625 grip drilled shank undrilled head non-locking cad plated

NAS6604DH10 .2500-28 thread .625 grip drilled shank drilled head

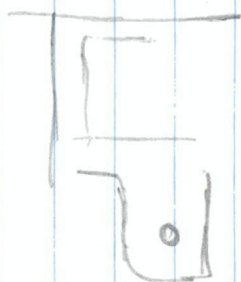
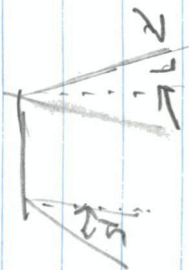
Product information and part numbers shown on these pages are not guaranteed correct by AVIAQUIP PTY. LTD and are subject to change without notice.



Aft mount

MID

Front



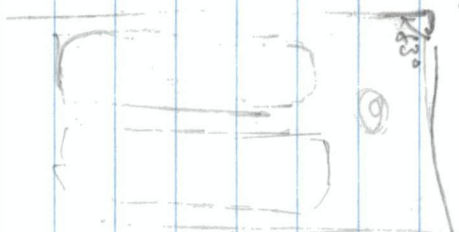
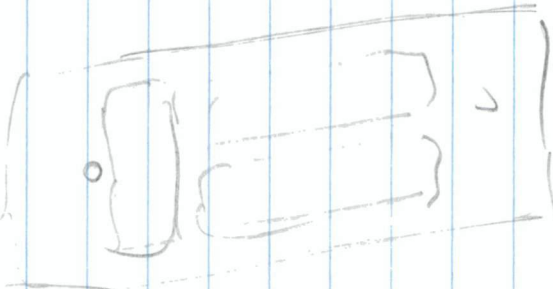
1.14

1.64

1.480

← 1.78 →
@ web

1.41



74 7/8 c/c top hole.

74 31/32 c/c bottom hole.

Bulk head can'ted 5.6

AT = 0.770

(and

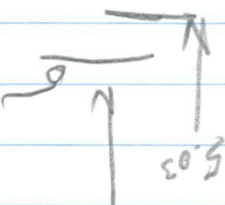
AT

$\phi 0.196$
 $\phi 0.200$

3.850

4.230

5.03



(and

0.36

4.156

5.06



0.62

3.765

4/56

5.12

8.68

0.48

8.96

5.06

1.52

8.0

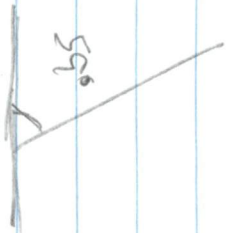
4.04

2.08

3.85

4.23

450-437-3400

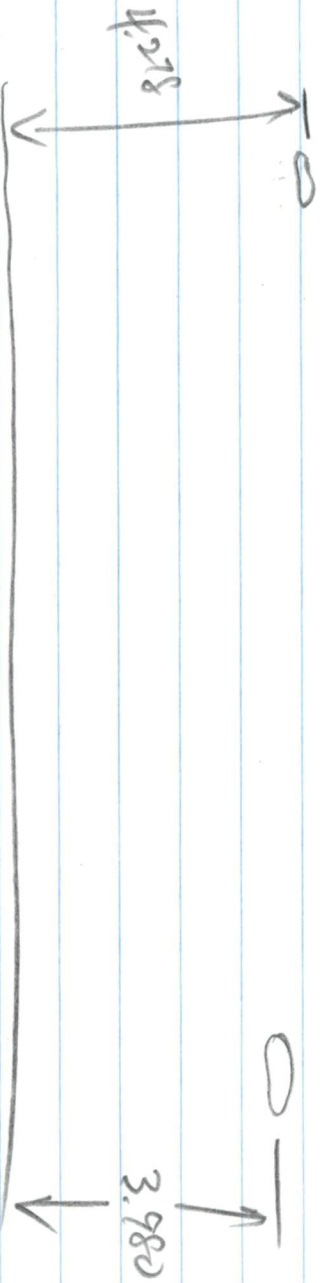


At

fur Fts.

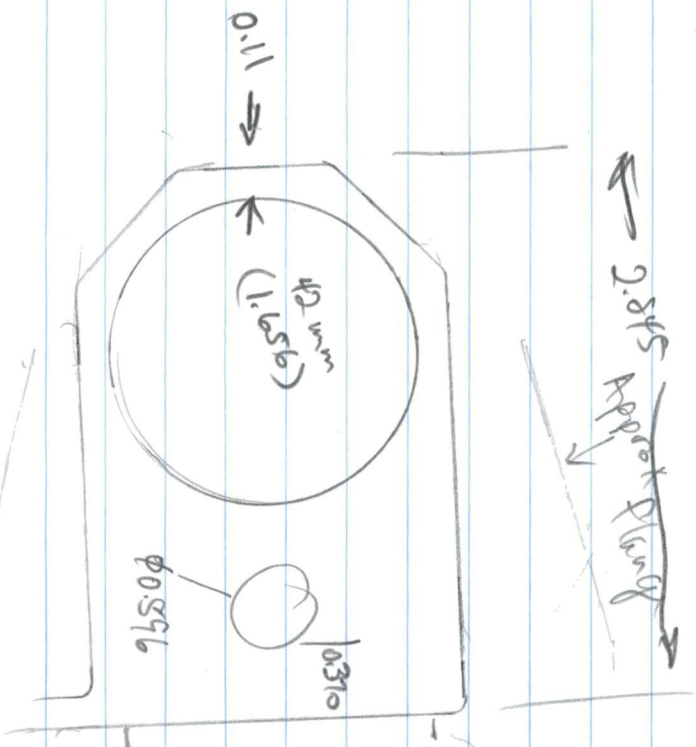
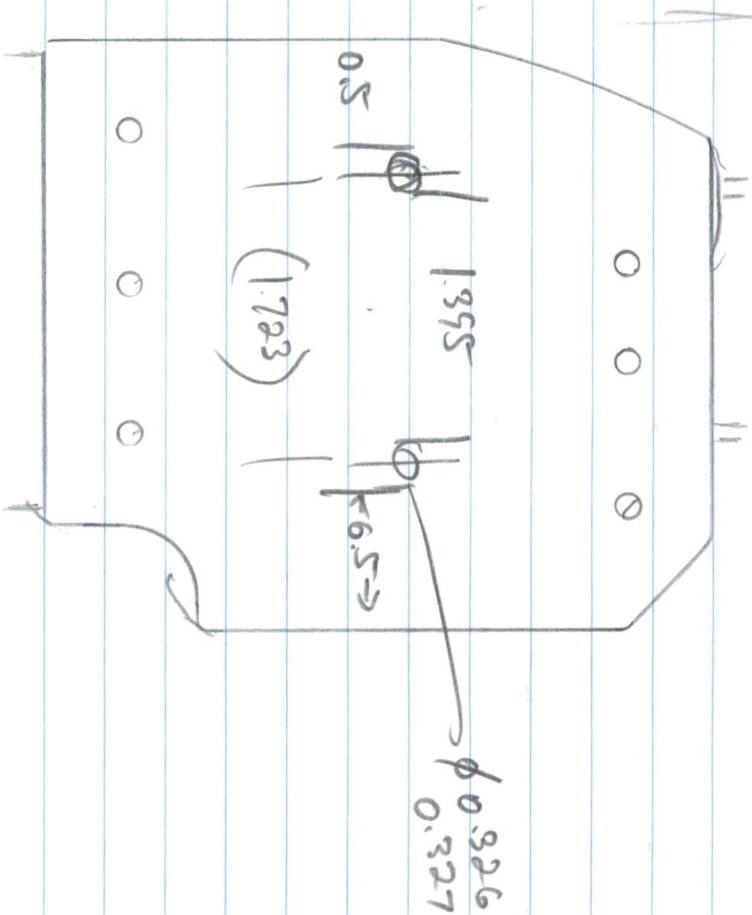
At

fur



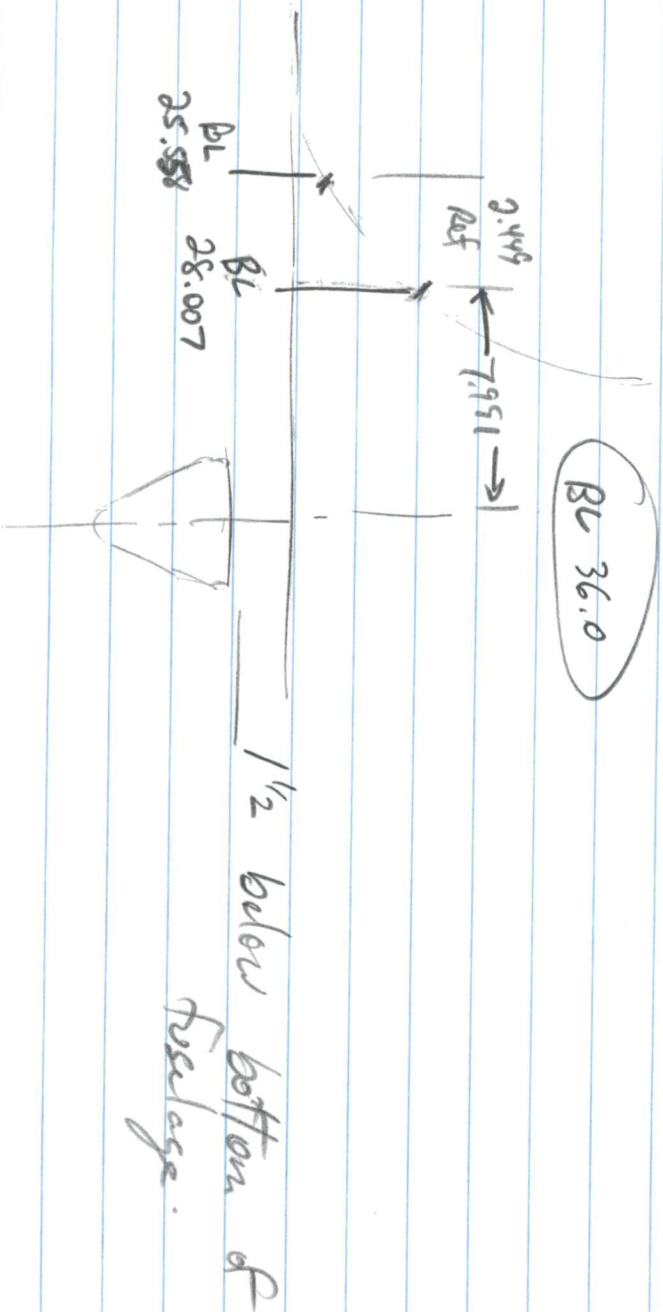
height table to q of bottom hole.

3.042



Approx
Flange.

h429 Step

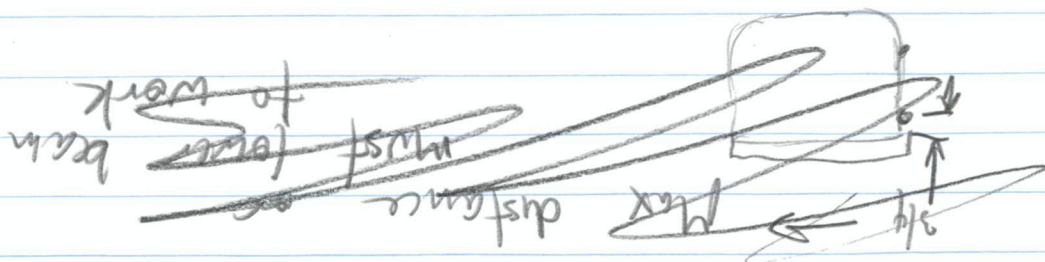
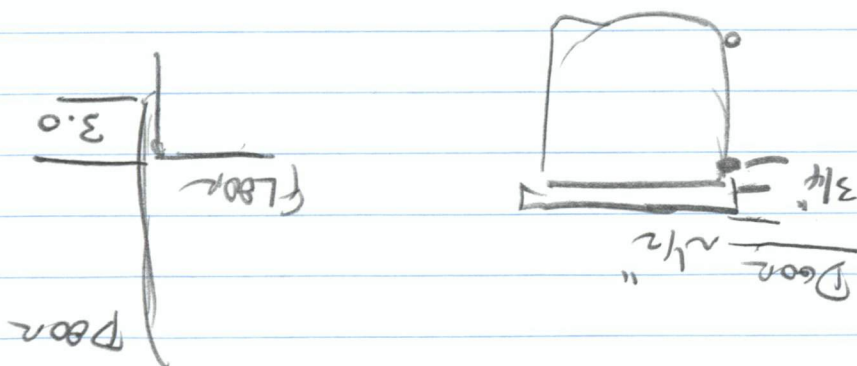
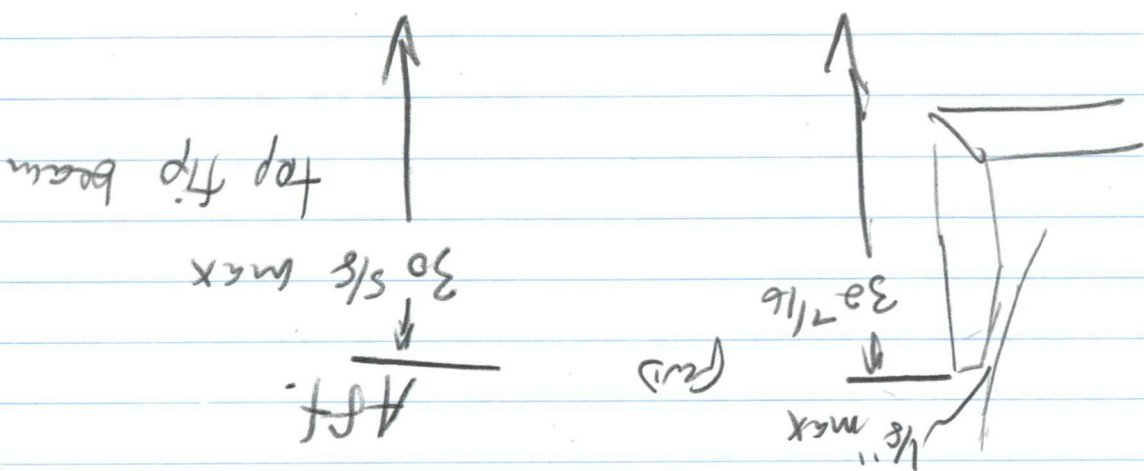


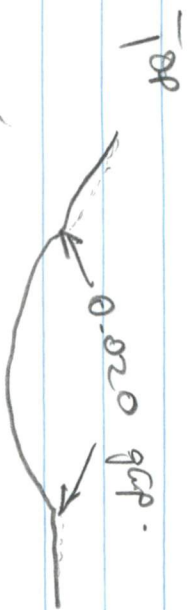
3.25
1.56

Insert info end of beam tube for far side step.

MARKS ON AFT SIDE OF AFT FTG ARE SUSPECT
STRAIGHT EDGE SITTING ON RIVETS.

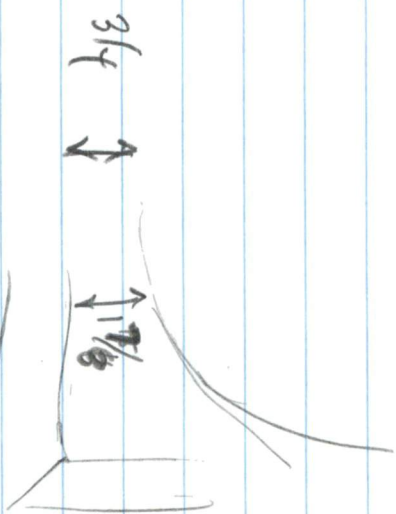
Aft fitting → move web fwd $\frac{1}{4}$ " to match
not spacing





Front fitting

FLCAT WATER SENSOR
INTERFERES w/
FWD BEAM.

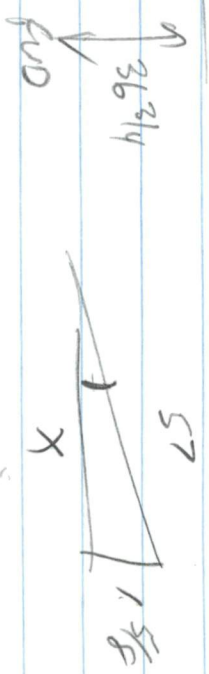
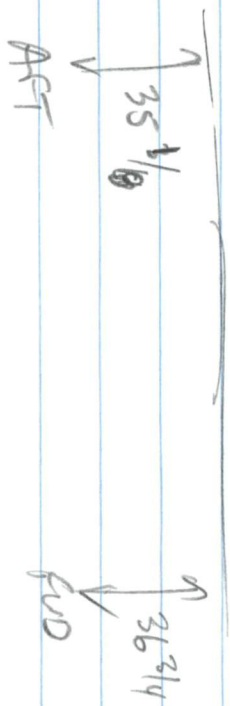


FWD Aft — don't move vertical

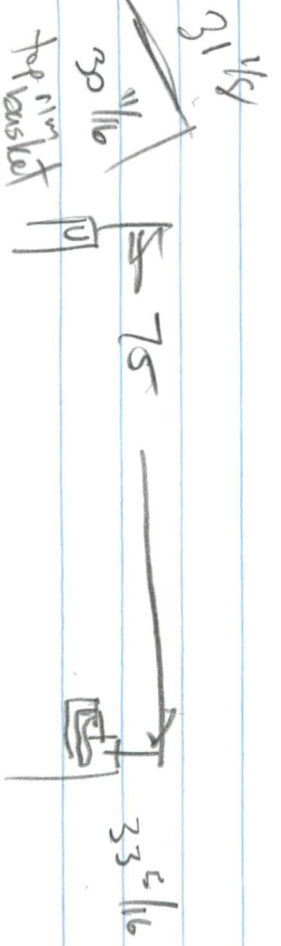
57

$\frac{13}{8} / 57$

floor



X



$$\frac{75}{57} \times 1.625 = A \text{ ft BEAM } 2.138$$

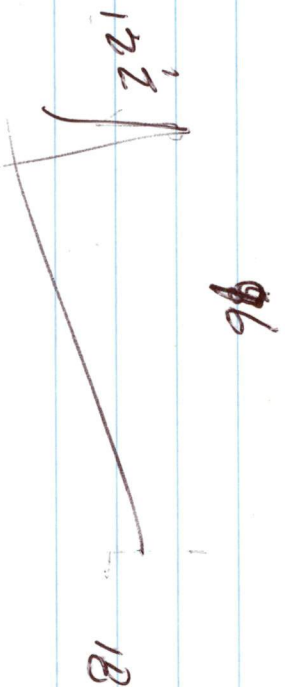
+ HEIGHT OF BACK

= HEIGHT OF FRONT

$$32.8125$$

$$32 \frac{13}{16}$$

$$33 \frac{1}{4}$$

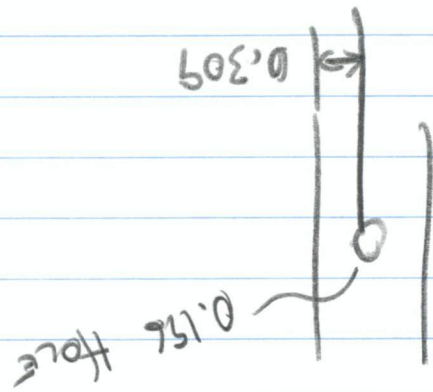


18

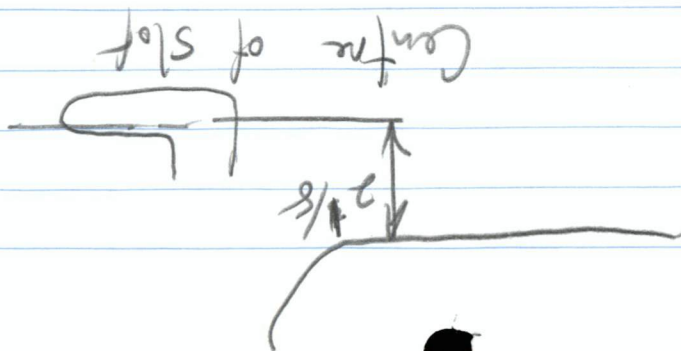
$$12 \frac{1}{2} = \frac{1}{18}$$

$$18 =$$

Aft fitting
contact



to bottom of door



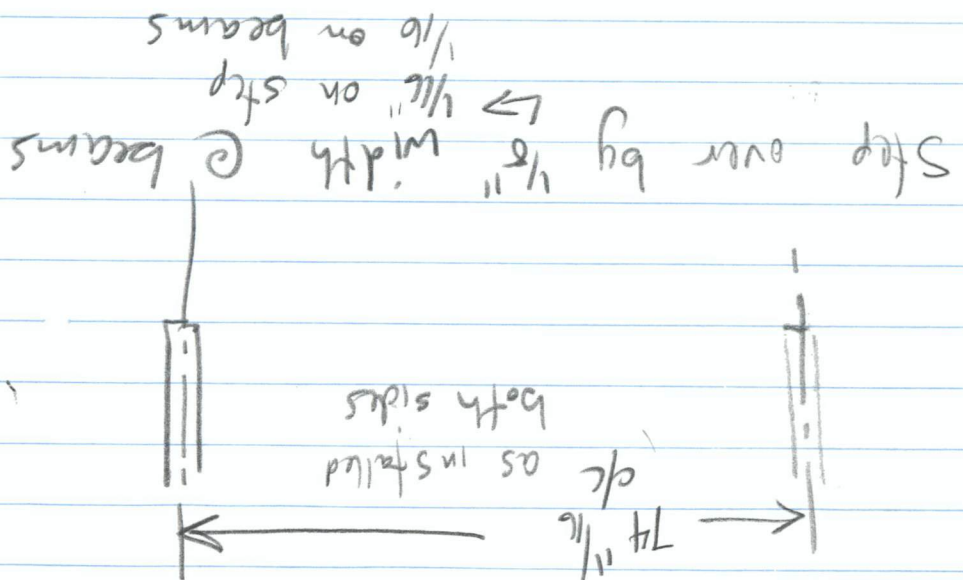
EMAIL FS/BL for attach points

BL 27.80
WL 8.62

FWD PRICE 163.36

258.11

More web $\frac{1}{16}$ " to make $74\frac{3}{4}$



Blade. Tape on gear @ basket contact point
 ↳ Bell bolt on blade. same piece

ransport Canada Transports Canada

#1100, 9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

NOTESLIP

Date 18-Nov-13
No. of pages (including cover sheet)

Our File: C-13-0832
SH12-58 – Iss. 2
Your File: 969

To: **AERO DESIGN LTD.**
9888A MALASPINA ROAD
POWELL RIVER BC
V8A 0G3

From Debbie Dubyk
Phone 780-495-7412
Fax Phone 780-495-7963

ATTN: JEFF CLARKE
Phone (604) 483-2376
Fax Phone (604) 483-2372

SUBJECT: TCCA APPROVED DOCUMENTS – PROJECT C-13-0832; SH12-58 – ISSUE 2

Hi Jeff:

Please find enclosed the following documents pertaining to the above noted Project:

1. Signed Application Form.
2. DCL959-1, Rev. 1 – TCCA Approved 2013 August 30.
3. DCL959-2, Rev. 1 – TCCA Approved 2013 August 30
4. DCL969-1, Rev. 1 – TCCA Approved 2013 August 30
5. FMS959.90, Rev. 1 – TCCA Approved 2013 August 30
6. FMS969.90, Rev. 1 – TCCA Approved 2013 August 30

Provided for your records.

Thanks



Debbie Dubyk

Operational Support Assistant

Canada 

C-13-0832.

MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD959, Rev. 1

1. NAME AND ADDRESS OF APPLICANT:

AERO Design Ltd.
9888A Malaspina Road
Powell River, BC
V8A 0G3

2. ALL CORRESPONDANCE TO:

AERO Design Ltd.
9888A Malaspina Road
Powell River, BC
V8A 0G3

3. IDENTIFICATION OF PRODUCT:

MAKE:
Bell

MODEL:
429

SERIAL No.:
All Eligible

REGISTRATION:
All Eligible

4. REQUEST FOR:

- A. ☐ SUPPLEMENTAL TYPE CERTIFICATE (STC) B. ☒ STC REVISION STC No. SH12-58 Issue 2
C. ☐ LIMITED STC (LSTC) D. ☐ LSTC REVISION LSTC No. Issue
E. ☐ REPAIR DESIGN CERTIFICATE (RDC) F. ☐ RDC REVISION RDC No. Issue
G. ☐ F.A.A. SUPPLEMENTAL TYPE CERTIFICATE H. ☐ FAA STC REVISION STC No. Issue
I. ☐ FAMILIARIZATION OF A FOREIGN TYPE DESIGN CHANGE

FAA STC # _____

EASA STC # _____

OTHER STC # _____

Technical Data update
without reissuing the STC

5. TITLE OF MODIFICATION OR REPAIR:

External Cargo Basket and Cabin Steps Installation

6. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR:

Installation of quick release cargo basket, fixed cabin step, and optional quick release cabin step.

7. APPLICABLE TYPE CERTIFICATE (TC) DOCUMENTS:

A. Cdn. TC NO. H-107

B. Foreign TC No.

C. OTHER (Please specify)

8. PROPOSED BASIS OF APPROVAL:

A. SAME AS Cdn. TC ☒B. SAME AS Foreign TC ☐C. OTHER ☐ (Please specify)

9.

DOCUMENTATION CHECKLIST

REQUIRED

(FOR DOT USE ONLY)

RECEIVED

YES

NO

YES

NO

DATE

COMPLIANCE PROGRAM

X

MASTER DRAWING LIST

X

ENGINEERING REPORTS

X

MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS

X

WEIGHT AND MOMENT CHANGE

X

FLIGHT MANUAL SUPPLEMENT

X

INSTRUCTIONS FOR CONTINUING AIRWORTHINESS

X

AIRWORTHINESS LIMITATIONS

X

MAINTENANCE MANUAL SUPPLEMENT

X

ELECTRICAL LOAD ANALYSIS

X

FLIGHT TEST DATA

X

DESIGN DRAWINGS

X

DRAFT STC, LSTC OR RDA

X

OTHER (Specify):

10. APPLICANT'S REMARKS:

Application is for revision to technical documents without STC re-issue.

11. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.

Aero Design Ltd.

PER:

SIGNATURE OF APPLICANT

Engineering Technologist

TITLE

30 Aug 2013

DATE


12.

SIGNATURE REGIONAL AIRWORTHINESS ENGINEER

TITLE

DATE

DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|--|--|--|
| INSTALLATION DOCUMENTS | | |
| 95901 | Quick Release Cargo Basket Installation | 0 |
| FMS959.90 | Flight Manual Supplement | 1 |
| ICA959.91 | Instructions for Continued Airworthiness | 0 |
| FABRICATION DOCUMENTS | | |
| DCL959-11 | Document Control List for Basket Fabrication | 0 |
| APPROVAL: | | |
|  <p>Transport Canada / Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <i>[Signature]</i> Appr'l No. <u>5412-58</u> Appr'l Date <u>12-11-16</u> Issue No. <u>2</u> Issue Date <u>12-12-19</u> YY-MM-DD REV 1 13-08-30</p> | | <p>ORIGINAL DATE: 28 September 2012</p> <p>REVISION DATE: 30 August 2013</p> |
| <p>AERO DESIGN LTD. 2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca</p> | | |
| <p>SHEET 1 OF 1</p> | | <p>Bell 429 Quick Release Cargo Basket Installation</p> |
| <p>DCL959-1</p> | | <p>Rev. 1</p> |

DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|---|---|--|
| INSTALLATION DOCUMENTS | | |
| 95902 | Mounting Provisions Installation | 0 |
| FMS959.90 | Flight Manual Supplement | 1 |
| ICA959.91 | Instructions for Continued Airworthiness | 0 |
| FABRICATION DOCUMENTS | | |
| DCL959-12 | Document Control List for Mounting Provisions Fabrication | 0 |
| APPROVAL: | | |
|  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>5412-58</u> Appr'l Date <u>12-11-16</u> Issue No. <u>2</u> Issue Date <u>12-12-19</u> YY-MM-DD REV 1 13-08-30 | ORIGINAL DATE: 28 September 2012 REVISION DATE: 30 August 2013 | AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca |
| | SHEET 1 OF 1 | Bell 429 Quick Release Cargo Basket Mounting Provisions Installation |
| | DCL959-2 | Rev. 1 |

DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|--|---|---|
| INSTALLATION DOCUMENTS | | |
| 96901 | Fixed Cabin Step Installation | 0 |
| 96902 | Quick Release Cabin Step Installation | 0 |
| FMS969.90 | Flight Manual Supplement for Quick Release Step | 1 |
| ICA969.91 | Instructions for Continued Airworthiness | 0 |
| FABRICATION DOCUMENTS | | |
| DCL969-11 | Document Control List for Step Fabrication | 0 |
| APPROVAL: | | |
|  <div style="display: inline-block; vertical-align: top; margin-left: 10px;"> Transport Canada </div> <div style="display: inline-block; vertical-align: top; margin-left: 10px;"> Transports Canada </div> | | ORIGINAL DATE: 12 December 2012 REVISION DATE: 30 August 2013 |
| <div style="border: 1px solid black; padding: 5px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>5412-56</u> Appr'l Date <u>12-11-16</u> Issue No. <u>2</u> Issue Date <u>12-12-19</u> <small>YY - MM - DD</small> REV 1 13-08-30 </div> | | AERO DESIGN LTD. 2013 - 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca |
| SHEET 1 OF 1 | | Bell 429 Cabin Steps Installation |
| <h2 style="margin: 0;">DCL969-1</h2> | | Rev. <h2 style="margin: 0;">1</h2> |

BELL 429**ROTORCRAFT FLIGHT MANUAL SUPPLEMENT**
for the
INSTALLATION of the AERO DESIGN
QUICK RELEASE CARGO BASKET

Canadian Supplemental Type Certificate No. SH12-58
FAA Supplemental Type Certificate No. SR03317NY
EASA Supplemental Type Certificate No. 10043360

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 429 when fitted with the Quick Release Cargo Basket Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



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| I | Limitations | 3 |
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Record of Revisions

| Revision | Issue Date | Pages Revised | Date Inserted | By |
|----------|--------------|---------------|---------------|----|
| 0 | 8 Nov 2012 | None | | |
| 1 | 31 July 2013 | 1-8 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (136 kg).
2. V_{NE} is 130 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.
3. For Category A operations with the Cargo Basket installed, a weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.
4. Configuration: The helicopter must be fitted with either the Quick Release Cargo Basket or Quick Release Step (see FMS969.90, Revision 1 or later approved revision) on the quick release mounting provisions.

Note: Fixed Cabin Step installed opposite to quick release mounting provisions must remain installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

With the cargo basket installed:

1. AEO and OEI Climb performance is reduced by up to 100 fpm.
2. Cruise performance and range are reduced by approximately 12 percent.
3. Category A Performance – A weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.

V WEIGHT AND BALANCE

1. The following weight and balance is for the quick release cargo basket configuration, installed in accordance with drawing 95901.

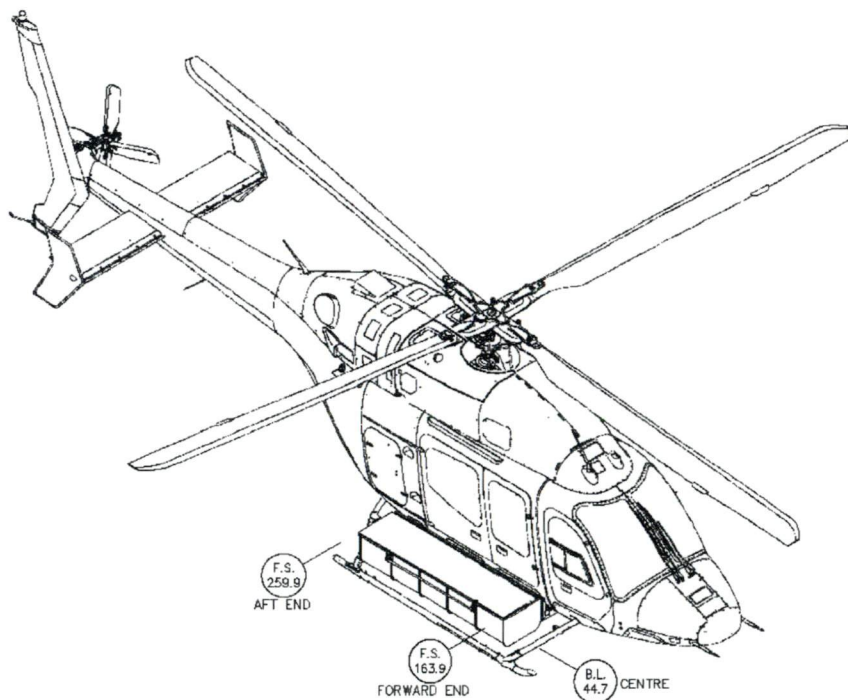


Figure V.1 – Quick Release Cargo Basket (95901 Configuration)

Quick Release Cargo Basket Configuration

| Item | Weight | Longitudinal | | Lateral | |
|--------------------------|---------|--------------|----------------|------------|------------------|
| | | Arm | Moment | Arm | Moment |
| Basket Only ¹ | 71.2 lb | 211.9 in | 15 084.4 in*lb | +/-44.7 in | +/-3182.6 in*lb |
| | 32.3 kg | 5381 mm | 173 792 mm*kg | +/-1135 mm | +/-36 668 mm*kg |
| Cargo ² (MAX) | 300 lb | 211.9 in | 63 558.0 in*lb | +/-44.7 in | +/-13410.0 in*lb |
| | 136 kg | 5381 mm | 732 268 mm*kg | +/-1135 mm | +/-154 500 mm*kg |

¹ Weight and balance is for Cargo Basket only. Mounting beams and attachment provisions are not included since they are included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Provisions are installed in accordance with drawing 95902. The Quick Release Basket is installed in accordance with drawing 95901. If the Quick Release Cargo Basket is removed, the Quick Release Cabin Step must be installed, refer to FMS969.90. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required.

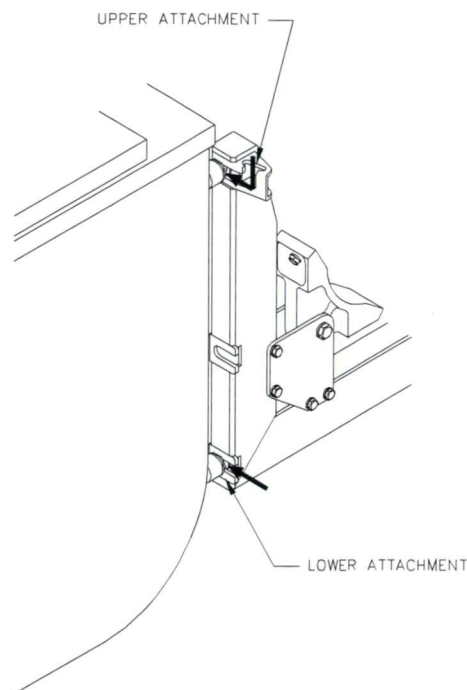


Figure VI.1 – Forward Basket Attachment

1. Basket Installation - Refer to Figure VI.1 and VI.2.
 1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
 2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.
 3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.

4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.
5. Check that basket is locked in place by attempting to lift aft end of basket.

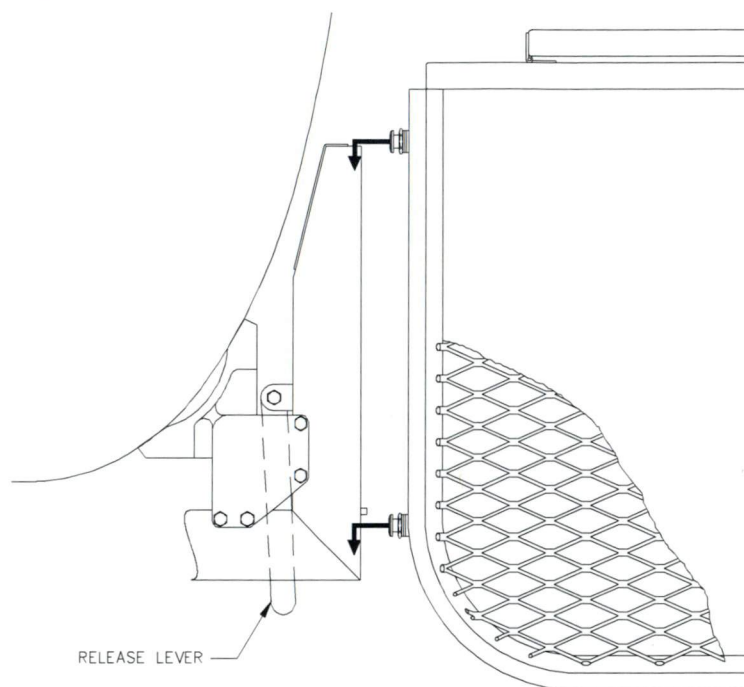


Figure VI.2 – Aft Basket Attachment

2. Basket Removal - Refer to Figure VI.1 and VI.2.
 1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
 2. Lift basket until upper attachment is out of keyway on aft beam.
 3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
 4. Lower aft end of basket to the ground.
 5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.

BELL 429

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
for the
INSTALLATION of the AERO DESIGN
QUICK RELEASE CABIN STEP

Canadian Supplemental Type Certificate No. SH12-58
FAA Supplemental Type Certificate No. SR03317NY
EASA Supplemental Type Certificate No. 10043360

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 429 when fitted with the Quick Release Cabin Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



AUG 30 2013

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| V | Weight and Balance | 4 |
| VI | Installation / removal instructions | 5 |

Record of Revisions

| Revision | Issue Date | Pages Revised | Date Inserted | By |
|----------|--------------|---------------|---------------|----|
| 0 | 03 Dec 2012 | None | | |
| 1 | 31 July 2013 | 1-3,5,6 | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |

I LIMITATIONS

1. Configuration: The helicopter must be fitted with either the Quick Release Step or Quick Release Cargo Basket (see FMS959.90, Revision 1 or later approved revision) on the mounting provisions.

Note: Fixed Cabin Step installed opposite to quick release mounting provisions must remain installed.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure the step is locked in position on the beams. Pull up on the aft end of the step to check.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

V WEIGHT AND BALANCE

1. The following weight and balance is for the quick release cabin step configuration, installed in accordance with drawing 96902.

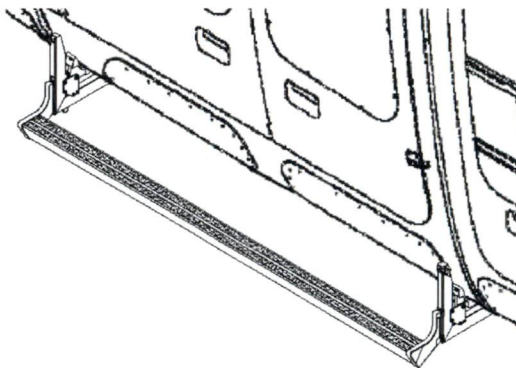


Figure V.1 – Quick Release Cabin Step (95902-01 Configuration)

96902-01-XX Quick Release Cabin Step Configuration

| Item | Weight | Longitudinal | | Lateral | |
|------------------------|--------|--------------|---------------|-------------|-----------------|
| | | Arm | Moment | Arm | Moment |
| Step Only ¹ | 6.0 lb | 201.25 in | 1207.50 in*lb | +/-35.76 in | +/-214.56 in*lb |
| | 2.7 kg | 5112 mm | 13912 mm*kg | +/-908 mm | +/-2472 mm*kg |

96902-11-XX Quick Release Cabin Step Configuration (Alternate)

| Item | Weight | Longitudinal | | Lateral | |
|------------------------|--------|--------------|---------------|-------------|-----------------|
| | | Arm | Moment | Arm | Moment |
| Step Only ¹ | 8.2 lb | 201.25 in | 1650.25 in*lb | +/-33.67 in | +/-251.33 in*lb |
| | 3.7 kg | 5112 mm | 19013 mm*kg | +/-855 mm | +/-2896 mm*kg |

¹ Weight and balance is for Quick Release Cabin Step only. Mounting beams and attachment provisions are not included since they are included in the basic rotorcraft weight and balance at time of initial installation.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Provisions are installed in accordance with drawing 95902. The Quick Release Cabin Step is installed in accordance with drawing 96902. If the Quick Release Cabin Step is removed, the Quick Release Cargo Basket must be installed, refer to FMS959.90. Logbook entry indicating installation or removal of step and which weight and balance amendment is in effect is required.

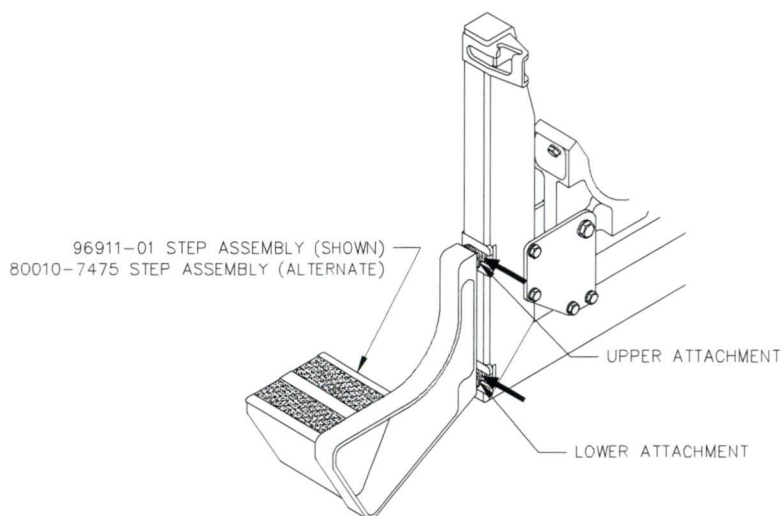


Figure VI.1 – Forward Step Attachment

1. Step Installation - Refer to Figure VI.1 and VI.2.
 1. Slide forward attachments of Quick Release Step Assembly 96911-01 (or 80010-7475, alternate configuration) into forward mounting beam.
 2. At aft end, rotate step inboard and pull step aft to aft mounting beam. Align attachment fittings on step with keyways, push step in and down to engage attachments into keyways on aft beam. Pin at lower attachment will spring into place with a snap.
 3. Check that step is secure by pulling up on aft end.

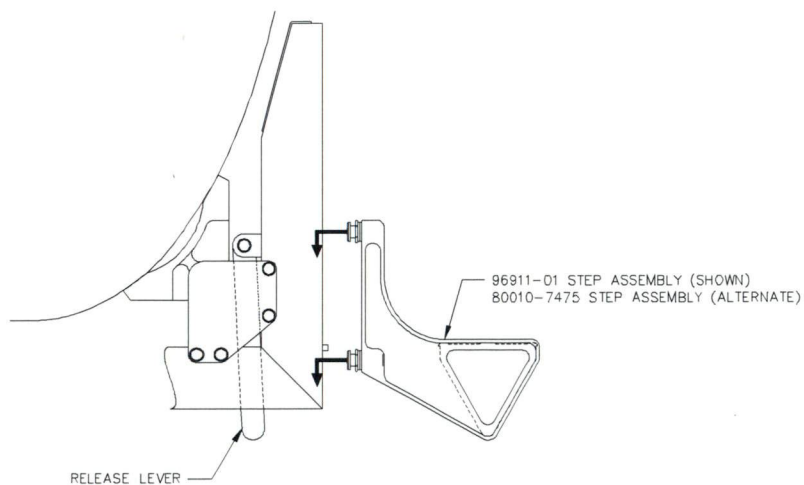


Figure VI.2 – Aft Step Attachment

2. Step Removal - Refer to Figure VI.1 and VI.2.

1. Pull lever at bottom end of aft beam inboard to retract retaining pin and lift step until lower attachment fitting is free of keyway. Keep upper attachment in slot in beam.
2. Lift step until upper attachment is out of keyway on aft beam. Slide step forward and rotate aft end outboard until forward attachments are free from keyways in forward beam.

31



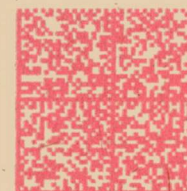
Transport
Canada

Transports
Canada

FROM: ROUTING SYMBOL
DE: SYMBOLE D'ACHEMINEMENT

RAXI

Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6



PB031 1924061
006667 T49qk
1119 145447



02.20

R3C 3M2 2013.11.19

ATTN: JEFF CLARKE
AERO DESIGN LTD
9888A MALASPINA ROAD
POWELL RIVER BC
V8A 0G3

Canada

02-0042 (0802-06)

PLEASE USE ROUTING SYMBOL ON ALL CORRESPONDENCE

PRIÈRE D'INDIQUER VOTRE SYMBOLE D'ACHÈNEMENT SUR
TOUTE CORRESPONDANCE



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Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada T2E 6R7

Number: SH12-58

Issue No.: 2

Approval Date: November 16, 2012

Issue Date: December 19, 2012

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

BELL 429

Canadian Type Certificate or Equivalent:

H-107 (BELL 429)

Description of Type Design Change:

Installation of External Attachment Provisions, Cargo Basket, and Cabin Steps

Installation/Operating Data,

Required Equipment and Limitations:

Configuration A – External Attachment Provisions Only:

Installation of the External Attachment Provisions to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL959-2, Revision 0, dated 28 September 2012, or later approved revision.

External Attachment Provisions installed in accordance with DCL959-2 may remain installed if the basket installation is removed.

Configuration B – External Cargo Basket:

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration B, External Cargo Basket Installation. Installation of Quick Release Cargo Basket to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL 959-1, Revision 0, dated 28 September 2012, or later approved revision. (continued)

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



D.S. Austen
For Minister of Transport



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration C – Cabin Steps

Installation of Configuration A, External Attachment Provisions, is a prerequisite for installation of Configuration C, Cabin Steps Installation. Installation of Cabin Steps to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL969-1, Revision 0, dated 12 December 2012, or later approved revision.

Transport Canada approved, AERO Design Ltd. Flight Manual Supplement FMS969.90, Revision 0, dated 03 December 2012, or later approved revision is required with this installation.

Transport Canada accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA969.91, Revision 0, dated 30 November 2012, or later accepted revision is required with this installation.

Cargo Basket Modifications:

Modifications to the Cargo Basket configurations are eligible in accordance with Transport Canada approved, AERO Design Ltd., Document Control List DCL704, Revision 6, dated 29 April 2010, or later approved revision. Eligibility limitations are noted on the drawings.

Data Pertinent to Configurations A and B:

Transport Canada approved, AERO Design Ltd. Flight Manual Supplement FMS959.90, Revision 0, dated 08 November 2012, or later approved revision is required with this installation.

Transport Canada accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA959.91, Revision 0, dated 28 September 2012, or later accepted revision is required with this installation.

Basis of Certification:

Basis of certification remains as defined in the applicable Type Certificate Data Sheets.

– End –



Transport
Canada

Transports
Canada

1100-9700 Jasper Avenue
Edmonton, Alberta T5J 4E6

November 16, 2012

Your file Votre référence
959

Our file Notre référence
C-12-0852
SH12-58

Aero Design Ltd.
2013 39th Avenue North East
Calgary, Alberta
Canada, T2E 6R7

ATTENTION: EDWARD BURGOIN – DAR 290M

Dear Sirs:

**SUBJECT: SUPPLEMENTAL TYPE CERTIFICATE NO. SH12-58 – ISSUE 1 DATED
NOVEMBER 16, 2012 – INSTALLATION OF EXTERNAL ATTACHMENT
PROVISIONS AND CARGO BASKET – BELL 429 ISSUED TO AERO DESIGN
LTD.**

This Supplemental Type Certificate (STC) is issued in response to your application. Included with the STC are the documents bearing the original Transport Canada signatures.

The transfer of this SH12-58 in the name of another person requires the prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 521.357.

To accomplish this modification, the requirements of CAR 561 apply if parts are manufactured.

Embodiment of this modification is considered to be a maintenance activity and the requirements of CAR 571.06(4) will apply.

An STC holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR V, Division IX. Other obligations as a Design Approval Document Holder are contained in CAR 521, Division VIII.


Yours truly,

J. Staal
Engineering Technologist, Engineering
Civil Aviation
Prairie and Northern Region
Phone: 780-495-5227
Facs: 780-495-7963

Encl.

Canada

DOCUMENT CONTROL LIST


| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|---|---|---|
| INSTALLATION DOCUMENTS | | |
| 95901 | Quick Release Cargo Basket Installation | 0 |
| FMS959.90 | Flight Manual Supplement | 0 |
| ICA959.91 | Instructions for Continued Airworthiness | 0 |
| FABRICATION DOCUMENTS | | |
| DCL959-11 | Document Control List for Basket Fabrication | 0 |
| APPROVAL: | | |
|  <div style="display: flex; justify-content: space-between; font-size: small;"> Transport Canada Transports Canada </div> <div style="text-align: center; border: 1px solid black; padding: 5px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>5H12-58</u> Appr'l Date <u>12-11-16</u> Issue No. <u>1</u> Issue Date <u>12-11-16</u> <small>YY-MM-DD</small> </div> | ORIGINAL DATE: 28 September 2012 REVISION DATE: | AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca |
| | SHEET 1 OF 1 | Bell 429 Quick Release Cargo Basket Installation |
| | DCL959-1 | Rev. <div style="text-align: center; font-size: large; font-weight: bold;">0</div> |

DOCUMENT CONTROL LIST


| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|-------------------------------|---|----------|
| INSTALLATION DOCUMENTS | | |
| 95902 | Mounting Provisions Installation | 0 |
| FMS959.90 | Flight Manual Supplement | 0 |
| ICA959.91 | Instructions for Continued Airworthiness | 0 |
| FABRICATION DOCUMENTS | | |
| DCL959-12 | Document Control List for Mounting Provisions Fabrication | 0 |

| |
|--|
| APPROVAL: <div style="border: 1px solid black; padding: 5px; margin: 5px;"> <div style="display: inline-block; text-align: center;"> Transport Canada </div> <div style="display: inline-block; text-align: center;"> Transports Canada </div> </div> <p style="text-align: center; margin-top: 10px;">AIRCRAFT CERTIFICATION DIVISION</p> <p style="text-align: center; font-size: 1.2em; font-weight: bold;">APPROVED</p> <p>By <u></u></p> <p>Appr'l No. <u>5H12-58</u></p> <p>Appr'l Date <u>12-11-16</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>12-11-16</u></p> <p style="text-align: center; font-size: 0.8em;">YY - MM - DD</p> |
|--|


DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|--|---|---|
| FABRICATION DOCUMENTS | | |
| 95910 ✓ | Cargo Basket Assembly | 0 ✓ |
| 95911 ✓ | Basket Fabrication | 0 ✓ |
| 95912 ✓ | Lid Fabrication | 0 ✓ |
| 95915 ✓ | Basket Components - Forward Sheet | 0 ✓ |
| 95916 ✓ | Basket Components - Filler Sheets | 0 ✓ |
| 95917 ✓ | Basket Components - Lid Checker Plate | 0 ✓ |
| 95925 ✓ | Basket Components - Forward Attachment Hoop | 0 ✓ |
| 95926 ✓ | Basket Components - Aft Attachment Hoop | 0 ✓ |
| 95927 ✓ | Basket Components - Placard | 0 ✓ |
| 94520 ✓ | Basket Components - Hoop | 0 ✓ |
| 49215 ✓ | Basket Components - Spacer | 0 ✓ |
| 49216 ✓ | Basket Components - Spacer | 0 ✓ |
| 84255 ✓ | Handle Assembly | 1 ✓ |
| 84261 ✓ | Handle Bar Assembly | 1 ✓ |
| 84262 ✓ | Handle Bracket Assembly | 1 ✓ |
| 84265 ✓ | Handle Lever | 1 ✓ |
| 84267 ✓ | Handle Bracket | 0 ✓ |
| 84272 ✓ | Bushing | 0 ✓ |
| 36273 ✓ | Lid Bracket | 1 ✓ |
| 36274 ✓ | Bushing | 2 ✓ |
| 36275 ✓ | Bushing | 3 ✓ |
| 36277 ✓ | Handle Bar | 0 ✓ |
| 36278 ✓ | Spring | 2 ✓ |
| 36280 ✓ | Brace | 2 ✓ |
| ENGINEERING DOCUMENTS | | |
| ER959.01 ✓ | Engineering Report | 0 ✓ |
| ER959.02 ✓ | Engineering Report | 0 ✓ |
| ER842.01 ✓ | Engineering Report | 0 ✓ |
| | Flight Test Report – Transport Canada | |
| APPROVAL: | | |
|  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>5H12-58</u> Appr'l Date <u>12-11-16</u> Issue No. <u>1</u> Issue Date <u>12-11-16</u> <small>YY - MM - DD</small> | | ORIGINAL DATE: 28 September 2012 REVISION DATE: AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca |
| SHEET 1 OF 1 | | Bell 429 Quick Release Cargo Basket Basket Fabrication |
| DCL959-11 | | Rev. 0 |

DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|--|---------------------------------------|--|
| FABRICATION DOCUMENTS | | |
| 95920 ✓ | Forward Fitting Fabrication | 0 ✓ |
| 95921 ✓ | Aft Fitting Fabrication | 0 ✓ |
| 95922 ✓ | Plates Fabrication | 0 ✓ |
| 95923 ✓ | Bushings Fabrication | 0 ✓ |
| 95930 ✓ | Forward Beam Fabrication | 0 ✓ |
| 95931 ✓ | Aft Beam Fabrication | 0 ✓ |
| ENGINEERING DOCUMENTS | | |
| ER959.01 ✓ | Engineering Report | 0 ✓ |
| ER959.02 ✓ | Engineering Report | 0 ✓ |
| ER842.01 ✓ | Engineering Report | 0 ✓ |
| | Flight Test Report – Transport Canada | |
| APPROVAL: | | |
|  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>5H12-58</u> Appr'l Date <u>12-11-16</u> Issue No. <u>1</u> Issue Date <u>12-11-16</u> <small>YY - MM - DD</small> | | ORIGINAL DATE: 28 September 2012 REVISION DATE: AERO DESIGN LTD. 2013 – 39 th Ave NE, Calgary, Alberta, T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333 www.aerodesign.ca |
| SHEET 1 OF 1 | | Bell 429 Quick Release Cargo Basket Mounting Provisions Fabrication |
| DCL959-12 | | Rev. 0 |

DOCUMENT CONTROL LIST

| DOCUMENT NO. | DOCUMENT CONTENT | REVISION |
|---|--|---|
| FABRICATION DOCUMENTS | | |
| 70401 | Open Forward End Modification (Bell 206L/407 Fixed and McDonnell Douglas MD600N Quick Release Only) | 1 |
| 70402 | Lid Door Modification | 1 |
| 70403 ✓ | Auxiliary Latch Modification | 4 ✓ |
| 70404 | Open Forward End Modification (Bell 206L/407 Quick Release Only) | 2 |
| 70405 | Lid Step Modification | 3 |
| 70406 | Open Forward End Modification (Eurocopter AS350/AS355 and Bell 206B Quick Release Only) | 2 |
| 70407 | Open Forward End Modification (Eurocopter EC135 Quick Release Only) | 0 |
| 70408 ✓ | Installation, Hanger Wheel | 0 ✓ |
| 70411 | Open Forward End Modification (Bell 206L/407 Large Quick Release Only) | 0 |
| 70428 ✓ | Assembly, Hanger Wheel | 0 ✓ |
| 70438 ✓ | Parts, Hanger Wheel | 0 ✓ |
| ENGINEERING DOCUMENTS | | |
| ER704.02 | Engineering Report | 0 |
| APPROVAL: | | |
|  <p>Transport Canada / Transports Canada</p> <p>AIRCRAFT CERTIFICATION DIVISION</p> <p>APPROVED</p> <p>By: <i>[Signature]</i></p> <p>Appr'l No. <u>SH12-58</u></p> <p>Appr'l Date <u>12-11-16</u></p> <p>Issue No. <u>1</u></p> <p>Issue Date <u>12-11-16</u></p> <p>YY-MM-DD</p> | | <p>ORIGINAL DATE:</p> <p>10 May 2006</p> <p>REVISION DATE:</p> <p>13 November 2012</p> |
| | | <p>AERO DESIGN LTD.</p> <p>2013 - 39th Ave NE, Calgary, Alberta, T2E 6R7</p> <p>Ph. (403) 250-8027</p> <p>Fax. (403) 250-8333</p> |
| SHEET 1 OF 1 | | <p>Cargo Basket Modifications</p> |
| DCL704 | | <p>Rev.</p> <p style="font-size: 3em; text-align: center;">7</p> |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.
2013 39th Avenue NE
Calgary, Alberta, T2E 6R7

DATE: 06 September 2012
REV. No. 1 08 Nov 2012



CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell Helicopter
MODEL: 429

REGISTRATION: All Applicable
SERIAL No.: All Applicable

NATURE OF WORK: Installation of Side-Mounted External Cargo Basket

MODEL CERTIFICATION BASIS: CAR527, Change 527-6
MODIFICATION CERTIFICATION BASIS: CAR527, Change 527-6

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|--|---|-------------------------------------|------|---|---|
| Subpart B – Flight | | | | | |
| 527.27 | Centre of Gravity Limits | N/A | | | No change from Type Approval. |
| 527.29 | Empty Weight and Corresponding C of G | Data specified on inst'n drawing | | X | |
| 527.51 | Takeoff | Flight Test | M.B. |  | Flight tests to be performed on Bell 429 by Transport Canada Flight Test and Bell Helicopters Test Pilot on instrumented helicopter Note: Per HQ Michel Brulotte F/T Report & emails. |
| 527.65 | Climb: All Engines Operating | Flight Test | M.B. | | |
| 527.67 | Climb: One Engine Inoperative | Flight Test | M.B. | | |
| 527.71 | Gliding Performance | Flight Test | M.B. | | |
| 527.75 | Landing | Flight Test | M.B. | | |
| 527.141 | Flight Characteristics – General | Flight Test | M.B. | | |
| 527.143 | Controllability and Maneuverability | Flight Test | M.B. | | |
| 527.171 | Stability – General | Flight Test | M.B. | | |
| 527.173 | Longitudinal Stability | Flight Test | M.B. | | |
| 527.175 | Demonstration of Longitudinal Stability | Flight Test | M.B. | | |
| 527.177 | Static Directional Stability | Flight Test | M.B. | | |
| 527.231 | Ground and Water Handling - General | Flight Test | M.B. | | |
| 527.241 | Ground Resonance | Flight Test | M.B. | | |
| 527.251 | Vibration | Flight Test | M.B. | | |
| Subpart C – Strength Requirements | | | | | |
| 527.301 | Loads – Air Drag Loads | Analysis | X |  | |
| 527.301 | Loads – Inertia Loads | Compliance with 527.337 and 527.561 | X | | |
| 527.303 | Factor of Safety | Analysis | X | | |

AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|---------------------------|---|-----------------------------------|------------------|-----|---|
| 527.305 | Strength and Deformation | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.307 | Proof of Structure | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.337(a) | Limit Maneuvering Load Factor – Positive | Analysis and Test iaw AC 43.13-1A | | X | |
| 527.547 | Main Rotor Structure | Flight Test | | X | Critical load factor in downward direction. See comments for flight test above |
| 527.561 | Emergency Landing Conditions | | M.B. | | |
| 527.561(a) | General | N/A | pd HQ F/T. | | Paragraphs (b)-(d) do not apply to this installation |
| 527.561(b) | Structure Design | N/A | | | Not an item of mass inside the cabin that could endanger the occupants of the cabin |
| 527.561(c) | Supporting Structure Design | N/A | | | Not an item of mass located above or behind the occupants of the cabin |
| 527.561(d) | Fuselage Structure near fuel tanks | N/A | | | Not structure in the area of internal fuel tanks |

Subpart D – Design and Construction

| | | | | | |
|-----------------|--|------------------------------------|--|----|--|
| 527.601 | Design | Drawings | | X | Design is conventional. |
| 527.603 | Materials | Drawings | | X | Materials used are specified in Mil-Hdbk-5H. |
| 527.605 | Fabrication Methods | Drawings | | X | Design is conventional. |
| 527.609 | Protection of Structure | Drawings | | X | |
| 527.611 | Inspection Provisions | Drawings | | X | Design is easy to inspect. |
| 527.613 | Material Strength Properties and Design Values | Values used as per Mil-Hdbk-5J | | X | |
| 527.625 | Fitting Factor | Analysis | | X | |
| 527.727 | Reserve Energy Absorption Drop Test | Statement in Report | | ** | Installation does not exceed ground clearance required to meet reserve energy drop test as specified by Bell Helicopters. |
| 527.783 | Doors | N/A | | | Installation does not block doors. |
| 527.787(a) | Cargo and Baggage Compartments | Compliance with 23.301 through 307 | | X | |
| 527.787(b) | Cargo and Baggage Compartments | Design | | X | Basket is a closed container. |
| 527.787(c), (d) | Cargo and Baggage Compartments | N/A | | | Cargo is external to helicopter. |
| 527.807 | Emergency Exits | N/A | | | Installation does not block doors. |
| 527.865 | External Load Attaching Means | N/A | | | |
| 527.1387 | Position Light System Dihedral Angles | Statement | | ** | Cargo basket is classified as a cargo compartment Position lights located on outboard sides of vertical fins on horizontal stabilizer. Basket installation does not extend outboard of vertical fins. |

| Airworthiness Requirement | Subject for Compliance or Documentary Proof | Form of Substantiation | DOT | DAR | Comments |
|---|---|---|------|-------------|--|
| 527.1401 | Anti-collision Light System | Statement | | **13 | Anticollision light located on top of vertical fin. Basket has no significant effect on visibility of anticollision light. |
| Subpart G – Operating Limitations and Information | | | | | |
| 527.1505 | Never Exceed Speed | Flight Test, Flight Manual Supplement | M.B. | JP | V _{NE} limits to be verified by flight test. |
| 527.1525 | Kinds of Operation | Flight Manual Supplement | M.B. | JP | Limited to VFR only. |
| 527.1529 | Instructions for Continuing Airworthiness | ICA Provided | M.B. | JP | |
| 527.1557(a) | Miscellaneous Markings and Placards – Baggage Compartments | Placard provided | | X 13 | |
| 527.1557(b) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(c) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1557(d) | Miscellaneous Markings and Placards | N/A | | | |
| 527.1581 | Rotorcraft Flight Manual – General | Flight Manual Supplement | M.B. | JP | FMS Per Michel Brulotte : concurrence. |
| 527.1583(c) | Operating Limitations – Weight and Loading Information | Flight Manual Supplement | M.B. | JP | |
| 527.1585 | Operating Procedures | Flight Manual Supplement | M.B. | JP | Placard installed on basket |
| 527.1587 | Performance Information | Flight Manual Supplement | M.B. | JP | |
| 527.1589 | Loading Information | Flight Manual Supplement & Placard | M.B. | JP | |
| Airworthiness Manual Requirements | | | | | |
| 5527.1581(e) | Rotorcraft Flight Manual – Units | SI and Imperial Units provided in Flight Manual Supplement | M.B. | JP | |

Note: M.B. indicates items being signed of by Michel Brulotte.

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

| | |
|--|--|
| Name of the applicant for the design change approval: | Aero Design Ltd. |
| Description of the design change: | Installation of Quick Release Cargo Baskets on Bell 429 |
| Certification Basis of design change and revision date: | CAR 527, Change 527-6 |
| CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed: | Section 0-3 of Supplemental ICA (ICA 959.91) |
| CAR Standard 513.05 (1) (g) (iv): Installation Instructions: | Installation Drawing 95901, 95902 |

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

| Regulatory Standard Reference Column 1 | Design Approval Holder (DAH) ICA Reference Column 2 | Applicant Means of Compliance Supplemental ICA Requirements Column 3 |
|--|---|--|
| A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided. | ICA ref: Bell 429 Maintenance Manual, BHT-429-MM | Supplemental ICA ref: Single Manual (ICA959.91) |
| A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement. | ICA ref: Bell 429 Maintenance Manuals | Supplemental ICA ref: Arranged in ATA format |
| A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information: | | |
| A527.3 (a) Rotorcraft maintenance manual or section | | |
| A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance. | ICA ref: Bell 429 Maintenance Manual, Chapter 1 | Supplemental ICA ref: Section 0-1 |
| A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances. | ICA ref: Bell 429 Maintenance Manual, Chapter 1 | Supplemental ICA ref: Section 0-5, 0-6 |

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

| Regulatory Standard Reference Column 1 | Design Approval Holder (DAH) ICA Reference Column 2 | Applicant Means of Compliance Supplemental ICA Requirements Column 3 |
|--|---|--|
| A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply. | ICA ref: N/A | Supplemental ICA ref: N/A |
| A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information. | ICA ref: Bell 429 Maintenance Manual, Chapter 12 | Supplemental ICA ref: N/A |
| A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information: | | |
| A527.3 (b) Maintenance Instructions. | | |
| A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft. | ICA ref: Bell 429 Maintenance Manual, Chapter 5 | Supplemental ICA ref: Section 5-1 |
| A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions. | ICA ref: N/A | Supplemental ICA ref: N/A |

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

| Regulatory Standard Reference Column 1 | Design Approval Holder (DAH) ICA Reference Column 2 | Applicant Means of Compliance Supplemental ICA Requirements Column 3 |
|--|--|---|
| A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken. | ICA ref: Bell 429 Maintenance Manual, Chapter 25 | Supplemental ICA ref: Section 25-1 thru 25-10 |
| A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations. | ICA ref: Bell 429 Maintenance Manual, Chapter 7 and 8 | Supplemental ICA ref: Section 25-11 |
| A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided. | ICA ref: N/A | Supplemental ICA ref: N/A |
| A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified. | ICA ref: Bell 429 Maintenance Manual, Chapter 5 | Supplemental ICA ref: Section 5-1 |
| A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection. | ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3 | Supplemental ICA ref: Section 5-3 |
| A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values. | ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2 | Supplemental ICA ref: Section 25-12 |
| A527.3 (g) Special tools (g) A list of special tools needed. | ICA ref: N/A | Supplemental ICA ref: N/A |

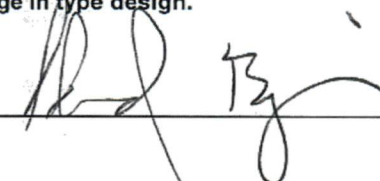
MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

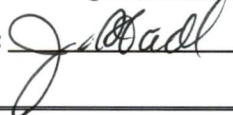
Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

| | | |
|---|---|---------------------------------|
| A527.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister." | ICA ref: Bell 429 Maintenance Manual, Chapter 4 | Supplemental ICA ref: Chapter 4 |
|---|---|---------------------------------|

BLOCK 4 – Applicant Statement of Compliance

| | |
|--|-------------------------|
| The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design. | |
| Applicants Signature:  | Date: 12 November, 2012 |
| Applicants Name: E. Burgoin, P.Eng. DAR 290M | |

BLOCK 5 – Minister's Statement of Acceptability

| | |
|---|---|
| The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister. | |
| Reviewer's Name: JACK STAAL | Phone # 780-495-5227 Email: ^{jack.staal} @tc.gc.ca Mail Routing Symbol: RAED |
| Signature:  | Date: Nov 15, 2012 NAPA Number |
| ICA 959.91, Rev 0, 28 Sept 2012 C-12-0852 | |

BELL 429

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN QUICK RELEASE CARGO BASKET

Canadian Supplemental Type Certificate No. SH12-58
FAA Supplemental Type Certificate No. XX
EASA Supplemental Type Certificate No. XX

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 429 when fitted with the Quick Release Cargo Basket or Quick Release Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



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Record of Revisions

| Revision | Issue Date | Pages Revised | Date Inserted | By |
|----------|------------|---------------|---------------|----|
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I LIMITATIONS

1. The maximum load in the AERO Design Ltd. Quick Release Cargo Basket is 300 lb. (136 kg).
2. V_{NE} is 130 KIAS except when the V_{NE} of the basic rotorcraft is more restrictive, in which case the lower V_{NE} applies.
3. For Category A operations with the Cargo Basket installed, a weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the aft end of the basket to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

CAUTION:

The rotorcraft glide angle is steeper than that of the basic helicopter when the AERO Design Ltd. Cargo Basket is installed.

IV PERFORMANCE

With the cargo basket installed:

1. AEO and OEI Climb performance is reduced by up to 100 fpm.
2. Cruise performance and range are reduced by approximately 12 percent.
3. Category A Performance – A weight penalty of 400 lbs must be added to the Gross Weight of the helicopter, in addition to the weight of the basket and the load it contains, when using the Category A WAT chart, and the Category A performance charts.

V WEIGHT AND BALANCE

1. The following weight and balance is for the quick release cargo basket configuration, installed in accordance with drawing 95901.

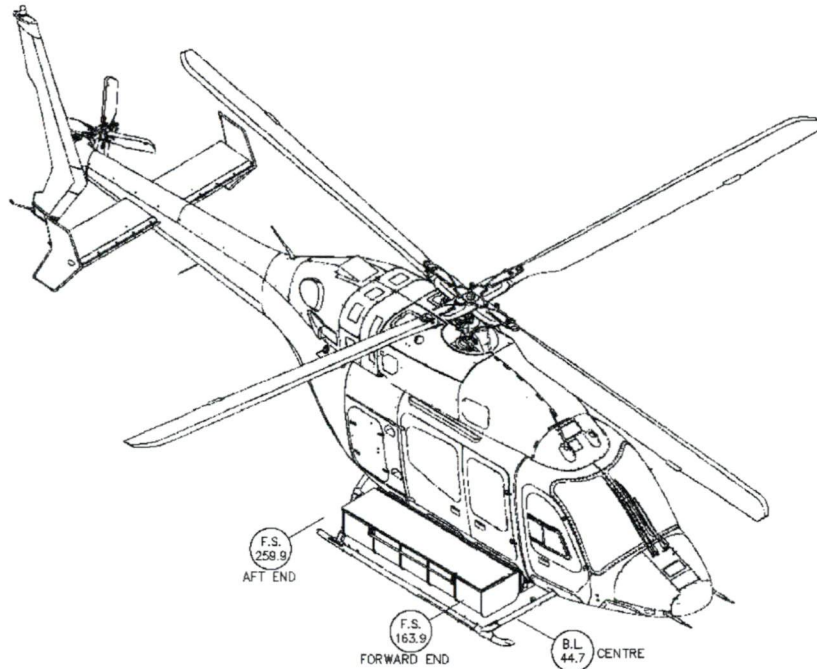


Figure V.1 – Quick Release Cargo Basket (95901 Configuration)

Quick Release Cargo Basket Configuration

| Item | Weight | Longitudinal | | Lateral | |
|-----------------------------|---------|--------------|----------------|---------|---------------|
| | | Arm | Moment | Arm | Moment |
| Basket Only ¹ | 71.2 lb | 211.9 in | 15 084.4 in*lb | 44.7 in | 3182.6 in*lb |
| | 32.3 kg | 5381 mm | 173 792 mm*kg | 1135 mm | 36 668 mm*kg |
| Cargo ² (MAX) | 300 lb | 211.9 in | 63 558.0 in*lb | 44.7 in | 13410.0 in*lb |
| | 136 kg | 5381 mm | 732 268 mm*kg | 1135 mm | 154 500 mm*kg |

AERO DESIGN LTD.

FMS959.90

¹ Weight and balance is for Cargo Basket only. Mounting beams and attachment provisions are not included since they are included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Provisions are installed in accordance with drawing 95902. The Quick Release Basket is installed in accordance with drawing 95901. Removal of the basket leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket and which weight and balance amendment is in effect is required.

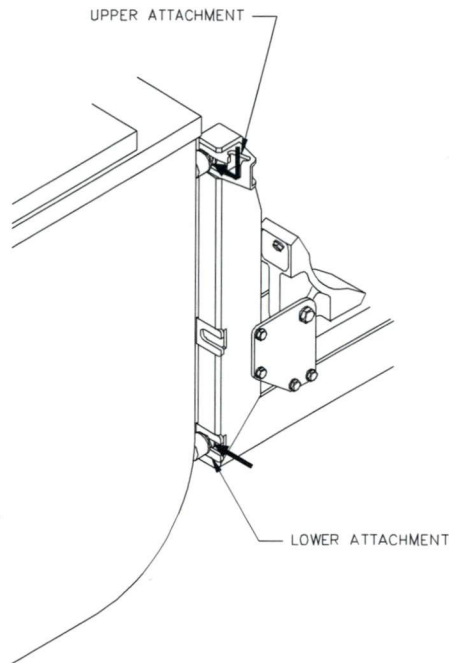


Figure VI.1 – Forward Basket Attachment

1. Basket Installation - Refer to Figure VI.1 and VI.2.
 1. Hook upper forward attachment on basket into upper keyway in forward mounting beam.
 2. Lift basket from aft end, slide lower forward attachment on basket into lower keyway on forward beam, and pull basket aft while rotating basket towards helicopter to seat attachments in forward beam.
 3. Lift basket to aft mounting beam, and engage aft attachments into keyways in aft beam.

4. Push basket down to lock basket into aft beam. Pin will spring into place with a snap.
5. Check that basket is locked in place by attempting to lift aft end of basket.

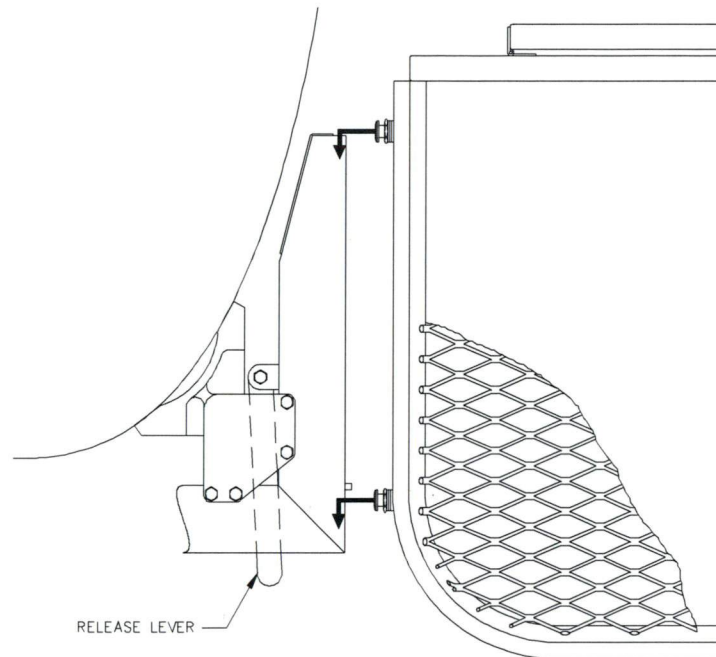


Figure VI.2 – Aft Basket Attachment

2. Basket Removal - Refer to Figure VI.1 and VI.2.
 1. Pull lever at bottom end of aft beam inboard and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in slot in beam.
 2. Lift basket until upper attachment is out of keyway on aft beam.
 3. Slide basket forward and rotate aft end outboard until lower forward attachment on basket is free from keyway in forward beam.
 4. Lower aft end of basket to the ground.
 5. At forward end of basket, raise basket until upper attachment is free of keyway. Remove basket from helicopter.



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